

SEQUENCE LISTING

<110> NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY
AMERSHAM BIOSCIENCES K.K.

<120> METHOD OF DETECTING BONE PAGET' S DISEASE

<130> YCT-882

<150> JP2002-323438

<151> 2002-11-07

<160> 70

<170> PatentIn version 3.1

<210> 1

<211> 2649

<212> DNA

<213> Homo sapiens

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<221> CDS

<222> (1)..(2649)

<223>

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| 1 5 10 15 | |
| gtg ctg ggc ttc acc gcc gcg tcc tgg ctc atc gcc ccc agg gtg gcg | 96 |
| Val Leu Gly Phe Thr Ala Ala Ser Trp Leu Ile Ala Pro Arg Val Ala | |
| 20 25 30 | |
| gag ctg agc gag agg aag aga cgt ggc tcc agc ctc tgc tcc tac tac | 144 |
| Glu Leu Ser Glu Arg Lys Arg Arg Gly Ser Ser Leu Cys Ser Tyr Tyr | |
| 35 40 45 | |
| ggt cgc tct gct gct ggc ccc cgc gcc ggc gct cag cag ccg ctc ccc | 192 |

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| Gly Arg Ser Ala Ala Gly Pro Arg Ala Gly Ala Gln Gln Pro Leu Pro | |
| 50 55 60 | |
| cag ccc cag tcc cga cca cgg cag gag cag tcc ccg ccc ccc gcg cgc | 240 |
| Gln Pro Gln Ser Arg Pro Arg Gln Glu Gln Ser Pro Pro Pro Ala Arg | |
| 65 70 75 80 | |
| cag gat ctc cag ggg cca ccg ctg ccc gag gca gca ccc ggg atc acc | 288 |
| Gln Asp Leu Gln Gly Pro Pro Leu Pro Glu Ala Ala Pro Gly Ile Thr | |
| 85 90 95 | |
| agt ttt cga agc agc ccc tgg cag cag cca cct ccg ctg cag cag cgg | 336 |
| Ser Phe Arg Ser Ser Pro Trp Gln Gln Pro Pro Pro Leu Gln Gln Arg | |
| 100 105 110 | |
| cgg cga gga cgc gag cct gag ggc gcg acg ggg ctt ccc ggt gct cca | 384 |
| Arg Arg Gly Arg Glu Pro Glu Gly Ala Thr Gly Leu Pro Gly Ala Pro | |
| 115 120 125 | |
| gcg gcc gag ggg gag ccc gag gag gag gac ggg ggc gcg gct ggg cag | 432 |
| Ala Ala Glu Gly Glu Pro Glu Glu Glu Asp Gly Gly Ala Ala Gly Gln | |
| 130 135 140 | |
| cgg aga gac ggc cgg ccg ggg agt agc cac aac ggc agc ggg gac ggg | 480 |
| Arg Arg Asp Gly Arg Pro Gly Ser Ser His Asn Gly Ser Gly Asp Gly | |
| 145 150 155 160 | |
| ggc gct gcc gcc ccg agc gcc cga ccc cgg gac ttc ctg tac gtg ggg | 528 |
| Gly Ala Ala Ala Pro Ser Ala Arg Pro Arg Asp Phe Leu Tyr Val Gly | |
| 165 170 175 | |
| gtg atg acc gcg cag aag tac ctg ggc agc cgc gcg ctg gcc gcg cag | 576 |
| Val Met Thr Ala Gln Lys Tyr Leu Gly Ser Arg Ala Leu Ala Ala Gln | |
| 180 185 190 | |
| cgg acc tgg gcg cgt ttc atc ccg ggc cgc gig gag ttc ttt tcc agc | 624 |
| Arg Thr Trp Ala Arg Phe Ile Pro Gly Arg Val Glu Phe Phe Ser Ser | |
| 195 200 205 | |
| cag cag ccc ccc aac gcc ggc cag ccc ccg cca ccc ctg cct gtc atc | 672 |
| Gln Gln Pro Pro Asn Ala Gly Gln Pro Pro Pro Pro Leu Pro Val Ile | |
| 210 215 220 | |
| gcg cia ccg ggt gig gac gac tcc tat cct ccc cag aaa aag tcc ttc | 720 |
| Ala Leu Pro Gly Val Asp Asp Ser Tyr Pro Pro Gln Lys Lys Ser Phe | |
| 225 230 235 240 | |
| atg atg atc aag tac atg cac gac cac tac ctg gac aag tat gag tgg | 768 |
| Met Met Ile Lys Tyr Met His Asp His Tyr Leu Asp Lys Tyr Glu Trp | |

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|---|-----|-----|------|
| 245 | 250 | 255 | |
| ttc atg cgc gcc gac gac gat gtc tac atc aaa ggt gat aaa tta gaa | | | 816 |
| Phe Met Arg Ala Asp Asp Asp Val Tyr Ile Lys Gly Asp Lys Leu Glu | | | |
| 260 | 265 | 270 | |
| gag ttt ctt aga tcg cta aac agc agt aag cct ctc tac ctg gga cag | | | 864 |
| Glu Phe Leu Arg Ser Leu Asn Ser Ser Lys Pro Leu Tyr Leu Gly Gln | | | |
| 275 | 280 | 285 | |
| act ggc ctg ggg aat att gaa gag ctt gga aag ctg gga ctg gag cct | | | 912 |
| Thr Gly Leu Gly Asn Ile Glu Glu Leu Gly Lys Leu Gly Leu Glu Pro | | | |
| 290 | 295 | 300 | |
| ggg gaa aac ttc tgt atg gga gga cct ggc atg atc ttt agc cga gaa | | | 960 |
| Gly Glu Asn Phe Cys Met Gly Gly Pro Gly Met Ile Phe Ser Arg Glu | | | |
| 305 | 310 | 315 | 320 |
| gtt ctc agg agg atg gtg cca cat att ggt gaa tgc ctt aga gaa atg | | | 1008 |
| Val Leu Arg Arg Met Val Pro His Ile Gly Glu Cys Leu Arg Glu Met | | | |
| 325 | 330 | 335 | |
| tac acg act cat gag gat gtg gaa gta gga aga tgc gtt cgc cgt ttt | | | 1056 |
| Tyr Thr Thr His Glu Asp Val Glu Val Gly Arg Cys Val Arg Arg Phe | | | |
| 340 | 345 | 350 | |
| ggt ggg act cag tgt gtc tgg tct tac gag atg caa caa ctg ttc cat | | | 1104 |
| Gly Gly Thr Gln Cys Val Trp Ser Tyr Glu Met Gln Gln Leu Phe His | | | |
| 355 | 360 | 365 | |
| gaa aat tat gaa cac aat cgg aag ggt tac atc caa gac ctt cac aat | | | 1152 |
| Glu Asn Tyr Glu His Asn Arg Lys Gly Tyr Ile Gln Asp Leu His Asn | | | |
| 370 | 375 | 380 | |
| agc aaa atc cat gca gcc ata aca ctt cat ccc aac aaa agg cct gca | | | 1200 |
| Ser Lys Ile His Ala Ala Ile Thr Leu His Pro Asn Lys Arg Pro Ala | | | |
| 385 | 390 | 395 | 400 |
| tac caa tac agg ctg cat aat tac atg ctc agc cgc aaa att tct gaa | | | 1248 |
| Tyr Gln Tyr Arg Leu His Asn Tyr Met Leu Ser Arg Lys Ile Ser Glu | | | |
| 405 | 410 | 415 | |
| ctt cgc tac cgc acc atc cag ctc cac agg gaa agt gcc ctg atg agc | | | 1296 |
| Leu Arg Tyr Arg Thr Ile Gln Leu His Arg Glu Ser Ala Leu Met Ser | | | |
| 420 | 425 | 430 | |
| aag ctc agt aac aca gaa gtg agc aaa gag gac cag cag ctg gga gtg | | | 1344 |
| Lys Leu Ser Asn Thr Glu Val Ser Lys Glu Asp Gln Gln Leu Gly Val | | | |
| 435 | 440 | 445 | |

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|---|------|
| ata cct tct ttc aac cac ttc cag cct cgg gag aga aat gaa gtg ata | 1392 |
| Ile Pro Ser Phe Asn His Phe Gln Pro Arg Glu Arg Asn Glu Val Ile | |
| 450 455 460 | |
| gaa tgg gag ttc ctg aca ggg aag ctt cta tac tca gca gct gag aac | 1440 |
| Glu Trp Glu Phe Leu Thr Gly Lys Leu Leu Tyr Ser Ala Ala Glu Asn | |
| 465 470 475 480 | |
| cag ccc cct cga cag agc ctc agt agc att tta aga aca gca ctg gat | 1488 |
| Gln Pro Pro Arg Gln Ser Leu Ser Ser Ile Leu Arg Thr Ala Leu Asp | |
| 485 490 495 | |
| gat acc gtc cta cag gtg atg gag atg atc aat gag aat gcc aag agc | 1536 |
| Asp Thr Val Leu Gln Val Met Glu Met Ile Asn Glu Asn Ala Lys Ser | |
| 500 505 510 | |
| aga gga cgg ctc att gac ttc aag gaa att cag tat ggc tac cgc aga | 1584 |
| Arg Gly Arg Leu Ile Asp Phe Lys Glu Ile Gln Tyr Gly Tyr Arg Arg | |
| 515 520 525 | |
| gtt aac ccc atg cac ggg gtg gag tac att ttg gat tta ctc ctt tta | 1632 |
| Val Asn Pro Met His Gly Val Glu Tyr Ile Leu Asp Leu Leu Leu Leu | |
| 530 535 540 | |
| tac aaa aga cac aag gga agg aaa ctg act gtg cca gtg aga cgt cat | 1680 |
| Tyr Lys Arg His Lys Gly Arg Lys Leu Thr Val Pro Val Arg Arg His | |
| 545 550 555 560 | |
| gcc tat ctt cag cag ttg ttc agc aag cct ttc ttc aga gag acc gaa | 1728 |
| Ala Tyr Leu Gln Gln Leu Phe Ser Lys Pro Phe Phe Arg Glu Thr Glu | |
| 565 570 575 | |
| gag cta gat gtc aac agt ctt gtg gag agt att aac agt gaa act cag | 1776 |
| Glu Leu Asp Val Asn Ser Leu Val Glu Ser Ile Asn Ser Glu Thr Gln | |
| 580 585 590 | |
| tca ttc tcc ttt ata tct aat tct tta aag ata tta tct tct ttt caa | 1824 |
| Ser Phe Ser Phe Ile Ser Asn Ser Leu Lys Ile Leu Ser Ser Phe Gln | |
| 595 600 605 | |
| ggt gcc aaa gaa atg gga ggg cac aat gaa aag aaa gta cac att ctc | 1872 |
| Gly Ala Lys Glu Met Gly Gly His Asn Glu Lys Lys Val His Ile Leu | |
| 610 615 620 | |
| gtt cct ctc atc gga agg tat gac att ttc ttg aga ttc atg gag aac | 1920 |
| Val Pro Leu Ile Gly Arg Tyr Asp Ile Phe Leu Arg Phe Met Glu Asn | |
| 625 630 635 640 | |
| ttt gaa aac atg tgt ctt atc cca aag cag aat gta aag ttg gtc att | 1968 |

| | |
|---|------|
| Phe Glu Asn Met Cys Leu Ile Pro Lys Gln Asn Val Lys Leu Val Ile | |
| 645 | 650 |
| aic ctt ttc agt agg gat tct ggc caa gac tcc agc aag cat att gag | 2016 |
| Ile Leu Phe Ser Arg Asp Ser Gly Gln Asp Ser Ser Lys His Ile Glu | |
| 660 | 665 |
| cig ata aaa ggg tac cag aac aag tac ccc aaa gca gaa atg acc ctg | 2064 |
| Leu Ile Lys Gly Tyr Gln Asn Lys Tyr Pro Lys Ala Glu Met Thr Leu | |
| 675 | 680 |
| atc cca atg aag gga gag ttt tcc aga ggt ctt ggt ctt gaa atg gct | 2112 |
| Ile Pro Met Lys Gly Glu Phe Ser Arg Gly Leu Gly Leu Glu Met Ala | |
| 690 | 695 |
| tct gcc cag ttt gac aat gac act ttg ctg cta ttt tgt gat gti gac | 2160 |
| Ser Ala Gln Phe Asp Asn Asp Thr Leu Leu Leu Phe Cys Asp Val Asp | |
| 705 | 710 |
| ttg atc ttc aga gaa gat ttt ctc caa cga tgt aga gac aat aca att | 2208 |
| Leu Ile Phe Arg Glu Asp Phe Leu Gln Arg Cys Arg Asp Asn Thr Ile | |
| 725 | 730 |
| cag gga caa cag gtg tac tat ccc atc atc ttt agc cag tat gac cca | 2256 |
| Gln Gly Gln Gln Val Tyr Tyr Pro Ile Ile Phe Ser Gln Tyr Asp Pro | |
| 740 | 745 |
| aag gta aca aac ggg gga aat cct ccc act gat ggt tac ttc ata ttc | 2304 |
| Lys Val Thr Asn Gly Gly Asn Pro Pro Thr Asp Gly Tyr Phe Ile Phe | |
| 755 | 760 |
| tca aaa aag act gga ttt tgg aga gac tat gga tat ggc atc acc tgt | 2352 |
| Ser Lys Lys Thr Gly Phe Trp Arg Asp Tyr Gly Tyr Gly Ile Thr Cys | |
| 770 | 775 |
| att tac aaa agt gat ctt cta ggt gca ggt gga ttt gat acc tca ata | 2400 |
| Ile Tyr Lys Ser Asp Leu Leu Gly Ala Gly Gly Phe Asp Thr Ser Ile | |
| 785 | 790 |
| caa ggc tgg gga cta gaa gat gta gat ctc tac aat aaa gtc att cia | 2448 |
| Gln Gly Trp Gly Leu Glu Asp Val Asp Leu Tyr Asn Lys Val Ile Leu | |
| 805 | 810 |
| tct ggc tta agg cca ttc aga agc caa gaa gta gga gtg gtg cat att | 2496 |
| Ser Gly Leu Arg Pro Phe Arg Ser Gln Glu Val Gly Val Val His Ile | |
| 820 | 825 |
| ttc cat cca gtt cat tgt gat cct aac ttg gac cct aag cag tat aag | 2544 |
| Phe His Pro Val His Cys Asp Pro Asn Leu Asp Pro Lys Gln Tyr Lys | |

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|---|-----|-----|------|
| 835 | 840 | 845 | |
| atg tgc tta gga tcc aag gca agt act ttc gcc tca acc atg caa ctg | | | 2592 |
| Met Cys Leu Gly Ser Lys Ala Ser Thr Phe Ala Ser Thr Met Gln Leu | | | |
| 850 | 855 | 860 | |
| gct gaa ctc tgg ctt gaa aaa cat tta ggt gtc agg tac aat cga act | | | 2640 |
| Ala Glu Leu Trp Leu Glu Lys His Leu Gly Val Arg Tyr Asn Arg Thr | | | |
| 865 | 870 | 875 | 880 |
| ctc tcc tga | | | 2649 |
| Leu Ser | | | |

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 <211> 882
 <212> PRT
 <213> Homo sapiens

<400> 2

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Val | Arg | Ser | Arg | Arg | Pro | Trp | Met | Ser | Val | Ala | Leu | Gly | Leu |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Leu | Gly | Phe | Thr | Ala | Ala | Ser | Trp | Leu | Ile | Ala | Pro | Arg | Val | Ala |
| | | 20 | | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Leu | Ser | Glu | Arg | Lys | Arg | Arg | Gly | Ser | Ser | Leu | Cys | Ser | Tyr | Tyr |
| | | 35 | | | | 40 | | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Arg | Ser | Ala | Ala | Gly | Pro | Arg | Ala | Gly | Ala | Gln | Gln | Pro | Leu | Pro |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Pro | Gln | Ser | Arg | Pro | Arg | Gln | Glu | Gln | Ser | Pro | Pro | Pro | Ala | Arg |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |

Gln Asp Leu Gln Gly Pro Pro Leu Pro Glu Ala Ala Pro Gly Ile Thr
85 90 95

Ser Phe Arg Ser Ser Pro Trp Gln Gln Pro Pro Pro Leu Gln Gln Arg
100 105 110

Arg Arg Gly Arg Glu Pro Glu Gly Ala Thr Gly Leu Pro Gly Ala Pro
115 120 125

Ala Ala Glu Gly Glu Pro Glu Glu Glu Asp Gly Gly Ala Ala Gly Gln
130 135 140

Arg Arg Asp Gly Arg Pro Gly Ser Ser His Asn Gly Ser Gly Asp Gly
145 150 155 160

Gly Ala Ala Ala Pro Ser Ala Arg Pro Arg Asp Phe Leu Tyr Val Gly
165 170 175

Val Met Thr Ala Gln Lys Tyr Leu Gly Ser Arg Ala Leu Ala Ala Gln
180 185 190

Arg Thr Trp Ala Arg Phe Ile Pro Gly Arg Val Glu Phe Phe Ser Ser
195 200 205

Gln Gln Pro Pro Asn Ala Gly Gln Pro Pro Pro Pro Leu Pro Val Ile
210 215 220

Ala Leu Pro Gly Val Asp Asp Ser Tyr Pro Pro Gln Lys Lys Ser Phe

225 230 235 240

Met Met Ile Lys Tyr Met His Asp His Tyr Leu Asp Lys Tyr Glu Trp
245 250 255

Phe Met Arg Ala Asp Asp Asp Val Tyr Ile Lys Gly Asp Lys Leu Glu
260 265 270

Glu Phe Leu Arg Ser Leu Asn Ser Ser Lys Pro Leu Tyr Leu Gly Gln
275 280 285

Thr Gly Leu Gly Asn Ile Glu Glu Leu Gly Lys Leu Gly Leu Glu Pro
290 295 300

Gly Glu Asn Phe Cys Met Gly Gly Pro Gly Met Ile Phe Ser Arg Glu
305 310 315 320

Val Leu Arg Arg Met Val Pro His Ile Gly Glu Cys Leu Arg Glu Met
325 330 335

Tyr Thr Thr His Glu Asp Val Glu Val Gly Arg Cys Val Arg Arg Phe
340 345 350

Gly Gly Thr Gln Cys Val Trp Ser Tyr Glu Met Gln Gln Leu Phe His
355 360 365

Glu Asn Tyr Glu His Asn Arg Lys Gly Tyr Ile Gln Asp Leu His Asn
370 375 380

Ser Lys Ile His Ala Ala Ile Thr Leu His Pro Asn Lys Arg Pro Ala
385 390 395 400

Tyr Gln Tyr Arg Leu His Asn Tyr Met Leu Ser Arg Lys Ile Ser Glu
405 410 415

Leu Arg Tyr Arg Thr Ile Gln Leu His Arg Glu Ser Ala Leu Met Ser
420 425 430

Lys Leu Ser Asn Thr Glu Val Ser Lys Glu Asp Gln Gln Leu Gly Val
435 440 445

Ile Pro Ser Phe Asn His Phe Gln Pro Arg Glu Arg Asn Glu Val Ile
450 455 460

Glu Trp Glu Phe Leu Thr Gly Lys Leu Leu Tyr Ser Ala Ala Glu Asn
465 470 475 480

Gln Pro Pro Arg Gln Ser Leu Ser Ser Ile Leu Arg Thr Ala Leu Asp
485 490 495

Asp Thr Val Leu Gln Val Met Glu Met Ile Asn Glu Asn Ala Lys Ser
500 505 510

Arg Gly Arg Leu Ile Asp Phe Lys Glu Ile Gln Tyr Gly Tyr Arg Arg
515 520 525

Val Asn Pro Met His Gly Val Glu Tyr Ile Leu Asp Leu Leu Leu Leu
530 535 540

Tyr Lys Arg His Lys Gly Arg Lys Leu Thr Val Pro Val Arg Arg His
545 550 555 560

Ala Tyr Leu Gln Gln Leu Phe Ser Lys Pro Phe Phe Arg Glu Thr Glu
565 570 575

Glu Leu Asp Val Asn Ser Leu Val Glu Ser Ile Asn Ser Glu Thr Gln
580 585 590

Ser Phe Ser Phe Ile Ser Asn Ser Leu Lys Ile Leu Ser Ser Phe Gln
595 600 605

Gly Ala Lys Glu Met Gly Gly His Asn Glu Lys Lys Val His Ile Leu
610 615 620

Val Pro Leu Ile Gly Arg Tyr Asp Ile Phe Leu Arg Phe Met Glu Asn
625 630 635 640

Phe Glu Asn Met Cys Leu Ile Pro Lys Gln Asn Val Lys Leu Val Ile
645 650 655

Ile Leu Phe Ser Arg Asp Ser Gly Gln Asp Ser Ser Lys His Ile Glu
660 665 670

Leu Ile Lys Gly Tyr Gln Asn Lys Tyr Pro Lys Ala Glu Met Thr Leu
675 680 685

Ile Pro Met Lys Gly Glu Phe Ser Arg Gly Leu Gly Leu Glu Met Ala
690 695 700

Ser Ala Gln Phe Asp Asn Asp Thr Leu Leu Leu Phe Cys Asp Val Asp
705 710 715 720

Leu Ile Phe Arg Glu Asp Phe Leu Gln Arg Cys Arg Asp Asn Thr Ile
725 730 735

Gln Gly Gln Gln Val Tyr Tyr Pro Ile Ile Phe Ser Gln Tyr Asp Pro
740 745 750

Lys Val Thr Asn Gly Gly Asn Pro Pro Thr Asp Gly Tyr Phe Ile Phe
755 760 765

Ser Lys Lys Thr Gly Phe Trp Arg Asp Tyr Gly Tyr Gly Ile Thr Cys
770 775 780

Ile Tyr Lys Ser Asp Leu Leu Gly Ala Gly Gly Phe Asp Thr Ser Ile
785 790 795 800

Gln Gly Trp Gly Leu Glu Asp Val Asp Leu Tyr Asn Lys Val Ile Leu
805 810 815

Ser Gly Leu Arg Pro Phe Arg Ser Gln Glu Val Gly Val Val His Ile

820

825

830

Phe His Pro Val His Cys Asp Pro Asn Leu Asp Pro Lys Gln Tyr Lys
 835 840 845

Met Cys Leu Gly Ser Lys Ala Ser Thr Phe Ala Ser Thr Met Gln Leu
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Ala Glu Leu Trp Leu Glu Lys His Leu Gly Val Arg Tyr Asn Arg Thr
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Leu Ser

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<222> (1)..(2328)

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| 1 5 10 15 | |
| gcc gtg ggc atc tcc ctg ggc ttc acc ctg agc ctg ctc agc gtc acc | 96 |
| Ala Val Gly Ile Ser Leu Gly Phe Thr Leu Ser Leu Leu Ser Val Thr | |
| 20 25 30 | |
| tgg gtg gag gag ccg tgc ggc cca ggc ccg ccc caa cct gga gac tct | 144 |

| | |
|---|-----|
| Trp Val Glu Glu Pro Cys Gly Pro Gly Pro Pro Gln Pro Gly Asp Ser | |
| 35 40 45 | |
| gag ctg ccg ccg cgc ggc aac acc aac gcg gcg cgc cgg ccc aac tcg | 192 |
| Glu Leu Pro Pro Arg Gly Asn Thr Asn Ala Ala Arg Arg Pro Asn Ser | |
| 50 55 60 | |
| gtg cag ccc gga gcg gag cgc gag aag ccc ggg gcc ggc gaa ggc gcc | 240 |
| Val Gln Pro Gly Ala Glu Arg Glu Lys Pro Gly Ala Gly Glu Gly Ala | |
| 65 70 75 80 | |
| ggg gag aat tgg gag ccg cgc gtc ttg ccc tac cac cct gca cag ccc | 288 |
| Gly Glu Asn Trp Glu Pro Arg Val Leu Pro Tyr His Pro Ala Gln Pro | |
| 85 90 95 | |
| ggc cag gcc gcc aaa aag gcc gtc agg acc cgc tac atc agc acg gag | 336 |
| Gly Gln Ala Ala Lys Lys Ala Val Arg Thr Arg Tyr Ile Ser Thr Glu | |
| 100 105 110 | |
| ctg ggc atc agg cag agg ctg ctg gtg gcg gtg ctg acc tct cag acc | 384 |
| Leu Gly Ile Arg Gln Arg Leu Leu Val Ala Val Leu Thr Ser Gln Thr | |
| 115 120 125 | |
| acg ctg ccc acg ctg ggc gtg gcc gtg aac cgc acg ctg ggg cac cgg | 432 |
| Thr Leu Pro Thr Leu Gly Val Ala Val Asn Arg Thr Leu Gly His Arg | |
| 130 135 140 | |
| ctg gag cgt gtg gtg ttc ctg acg ggc gca cgg ggc cgc cgg gcc cca | 480 |
| Leu Glu Arg Val Val Phe Leu Thr Gly Ala Arg Gly Arg Arg Ala Pro | |
| 145 150 155 160 | |
| cct ggc atg gca gtg gtg acg ctg ggc gag gag cga ccc att gga cac | 528 |
| Pro Gly Met Ala Val Val Thr Leu Gly Glu Glu Arg Pro Ile Gly His | |
| 165 170 175 | |
| ctg cac ctg gcg ctg cgc cac ctg ctg gag cag cac ggc gac gac ttt | 576 |
| Leu His Leu Ala Leu Arg His Leu Leu Glu Gln His Gly Asp Asp Phe | |
| 180 185 190 | |
| gac tgg ttc ttc ctg gtg cct gac acc acc tac acc gag gcg cac ggc | 624 |
| Asp Trp Phe Phe Leu Val Pro Asp Thr Thr Tyr Thr Glu Ala His Gly | |
| 195 200 205 | |
| ctg gca cgc cta act ggc cac ctc agc ctg gcc tcc gcc gcc cac ctg | 672 |
| Leu Ala Arg Leu Thr Gly His Leu Ser Leu Ala Ser Ala Ala His Leu | |
| 210 215 220 | |
| tac ctg ggc cgg ccc cag gac ttc atc ggc gga gag ccc acc ccc ggc | 720 |
| Tyr Leu Gly Arg Pro Gln Asp Phe Ile Gly Gly Glu Pro Thr Pro Gly | |

| | | | | |
|---|-----|-----|-----|------|
| 225 | 230 | 235 | 240 | |
| cgc tac tgc cac gga ggc ttt ggg gtg ctg ctg tgc cgc atg ctg ctg | | | | 768 |
| Arg Tyr Cys His Gly Gly Phe Gly Val Leu Leu Ser Arg Met Leu Leu | | | | |
| | 245 | 250 | 255 | |
| caa caa ctg cgc ccc cac ctg gaa ggc tgc cgc aac gac atc gtc agt | | | | 816 |
| Gln Gln Leu Arg Pro His Leu Glu Gly Cys Arg Asn Asp Ile Val Ser | | | | |
| | 260 | 265 | 270 | |
| gcg cgc cct gac gag tgg ctg ggt cgc tgc att ctc gat gcc acc ggg | | | | 864 |
| Ala Arg Pro Asp Glu Trp Leu Gly Arg Cys Ile Leu Asp Ala Thr Gly | | | | |
| | 275 | 280 | 285 | |
| gtg ggc tgc act ggt gac cac gag ggg gtg cac tat agc cat ctg gag | | | | 912 |
| Val Gly Cys Thr Gly Asp His Glu Gly Val His Tyr Ser His Leu Glu | | | | |
| | 290 | 295 | 300 | |
| ctg agc cct ggg gag cca gtg cag gag ggg gac cct cat ttc cga agt | | | | 960 |
| Leu Ser Pro Gly Glu Pro Val Gln Glu Gly Asp Pro His Phe Arg Ser | | | | |
| 305 | 310 | 315 | 320 | |
| gcc ctg aca gcc cac cct gtg cgt gac cct gtg cac atg tac cag ctg | | | | 1008 |
| Ala Leu Thr Ala His Pro Val Arg Asp Pro Val His Met Tyr Gln Leu | | | | |
| | 325 | 330 | 335 | |
| cac aaa gct ttc gcc cga gct gaa ctg gaa cgc acg tac cag gag atc | | | | 1056 |
| His Lys Ala Phe Ala Arg Ala Glu Leu Glu Arg Thr Tyr Gln Glu Ile | | | | |
| | 340 | 345 | 350 | |
| cag gag tia cag tgg gag atc cag aat acc agc cat ctg gcc gtt gat | | | | 1104 |
| Gln Glu Leu Gln Trp Glu Ile Gln Asn Thr Ser His Leu Ala Val Asp | | | | |
| | 355 | 360 | 365 | |
| ggg gac cgg gca gct gct tgg ccc gtg ggt att cca gca cca tcc cgc | | | | 1152 |
| Gly Asp Arg Ala Ala Ala Trp Pro Val Gly Ile Pro Ala Pro Ser Arg | | | | |
| | 370 | 375 | 380 | |
| ccg gcc tcc cgc ttt gag gtg ctg cgc tgg gac tac ttc acg gag cag | | | | 1200 |
| Pro Ala Ser Arg Phe Glu Val Leu Arg Trp Asp Tyr Phe Thr Glu Gln | | | | |
| 385 | 390 | 395 | 400 | |
| cac gct ttc tcc tgc gcc gat ggc tca ccc cgc tgc cca ctg cgt ggg | | | | 1248 |
| His Ala Phe Ser Cys Ala Asp Gly Ser Pro Arg Cys Pro Leu Arg Gly | | | | |
| | 405 | 410 | 415 | |
| gct gac cgg gct gat gtg gcc gat gtt ctg ggg aca gct cta gag gag | | | | 1296 |
| Ala Asp Arg Ala Asp Val Ala Asp Val Leu Gly Thr Ala Leu Glu Glu | | | | |
| | 420 | 425 | 430 | |

| | |
|---|------|
| ctg aac cgc cgc tac cac ccg gcc ttg cgg ctc cag aag cag cag ctg | 1344 |
| Leu Asn Arg Arg Tyr His Pro Ala Leu Arg Leu Gln Lys Gln Gln Leu | |
| 435 440 445 | |
| gtg aat ggc tac cga cgc ttt gat ccg gcc cgg ggt atg gaa tac acg | 1392 |
| Val Asn Gly Tyr Arg Arg Phe Asp Pro Ala Arg Gly Met Glu Tyr Thr | |
| 450 455 460 | |
| ctg gac ttg cag ctg gag gca ctg acc ccc cag gga ggc cgc cgg ccc | 1440 |
| Leu Asp Leu Gln Leu Glu Ala Leu Thr Pro Gln Gly Gly Arg Arg Pro | |
| 465 470 475 480 | |
| ctc act cgc cga gtg cag ctg ctc cgg ccg ctg agc cgc gtg gag atc | 1488 |
| Leu Thr Arg Arg Val Gln Leu Leu Arg Pro Leu Ser Arg Val Glu Ile | |
| 485 490 495 | |
| ttg cct gtg ccc tat gtc act gag gcc tca cgt ctc act gtg ctg ctg | 1536 |
| Leu Pro Val Pro Tyr Val Thr Glu Ala Ser Arg Leu Thr Val Leu Leu | |
| 500 505 510 | |
| cct cta gct gcg gct gag cgt gac ctg gcc cct ggc ttc ttg gag gcc | 1584 |
| Pro Leu Ala Ala Ala Glu Arg Asp Leu Ala Pro Gly Phe Leu Glu Ala | |
| 515 520 525 | |
| ttt gcc act gca gca ctg gag cct ggt gat gct gcg gca gcc ctg acc | 1632 |
| Phe Ala Thr Ala Ala Leu Glu Pro Gly Asp Ala Ala Ala Ala Leu Thr | |
| 530 535 540 | |
| ctg ctg cta ctg tat gag ccg cgc cag gcc cag cgc gtg gcc cat gca | 1680 |
| Leu Leu Leu Leu Tyr Glu Pro Arg Gln Ala Gln Arg Val Ala His Ala | |
| 545 550 555 560 | |
| gat gtc ttc gca cct gtc aag gcc cac gtg gca gag ctg gag cgg cgt | 1728 |
| Asp Val Phe Ala Pro Val Lys Ala His Val Ala Glu Leu Glu Arg Arg | |
| 565 570 575 | |
| ttc ccc ggt gcc cgg gtg cca tgg ctc agt gtg cag aca gcc gca ccc | 1776 |
| Phe Pro Gly Ala Arg Val Pro Trp Leu Ser Val Gln Thr Ala Ala Pro | |
| 580 585 590 | |
| tca cca ctg cgc ctc atg gat cta ctc tcc aag aag cac ccg ctg gac | 1824 |
| Ser Pro Leu Arg Leu Met Asp Leu Leu Ser Lys Lys His Pro Leu Asp | |
| 595 600 605 | |
| aca ctg ttc ctg ctg gcc ggg cca gac acg gtg ctc acg cct gac ttc | 1872 |
| Thr Leu Phe Leu Leu Ala Gly Pro Asp Thr Val Leu Thr Pro Asp Phe | |
| 610 615 620 | |
| ctg aac cgc tgc cgc atg cat gcc atc tcc ggc tgg cag gcc ttc ttt | 1920 |

Met Arg Ala Ser Leu Leu Leu Ser Val Leu Arg Pro Ala Gly Pro Val
 1 5 10 15

Ala Val Gly Ile Ser Leu Gly Phe Thr Leu Ser Leu Leu Ser Val Thr
 20 25 30

Trp Val Glu Glu Pro Cys Gly Pro Gly Pro Pro Gln Pro Gly Asp Ser
 35 40 45

Glu Leu Pro Pro Arg Gly Asn Thr Asn Ala Ala Arg Arg Pro Asn Ser
 50 55 60

Val Gln Pro Gly Ala Glu Arg Glu Lys Pro Gly Ala Gly Glu Gly Ala
 65 70 75 80

Gly Glu Asn Trp Glu Pro Arg Val Leu Pro Tyr His Pro Ala Gln Pro
 85 90 95

Gly Gln Ala Ala Lys Lys Ala Val Arg Thr Arg Tyr Ile Ser Thr Glu
 100 105 110

Leu Gly Ile Arg Gln Arg Leu Leu Val Ala Val Leu Thr Ser Gln Thr
 115 120 125

Thr Leu Pro Thr Leu Gly Val Ala Val Asn Arg Thr Leu Gly His Arg
 130 135 140

Leu Glu Arg Val Val Phe Leu Thr Gly Ala Arg Gly Arg Arg Ala Pro

| | | | |
|---|-----|-----|-----|
| 145 | 150 | 155 | 160 |
| Pro Gly Met Ala Val Val Thr Leu Gly Glu Glu Arg Pro Ile Gly His | | | |
| | 165 | 170 | 175 |
| Leu His Leu Ala Leu Arg His Leu Leu Glu Gln His Gly Asp Asp Phe | | | |
| | 180 | 185 | 190 |
| Asp Trp Phe Phe Leu Val Pro Asp Thr Thr Tyr Thr Glu Ala His Gly | | | |
| | 195 | 200 | 205 |
| Leu Ala Arg Leu Thr Gly His Leu Ser Leu Ala Ser Ala Ala His Leu | | | |
| | 210 | 215 | 220 |
| Tyr Leu Gly Arg Pro Gln Asp Phe Ile Gly Gly Glu Pro Thr Pro Gly | | | |
| 225 | 230 | 235 | 240 |
| Arg Tyr Cys His Gly Gly Phe Gly Val Leu Leu Ser Arg Met Leu Leu | | | |
| | 245 | 250 | 255 |
| Gln Gln Leu Arg Pro His Leu Glu Gly Cys Arg Asn Asp Ile Val Ser | | | |
| | 260 | 265 | 270 |
| Ala Arg Pro Asp Glu Trp Leu Gly Arg Cys Ile Leu Asp Ala Thr Gly | | | |
| | 275 | 280 | 285 |
| Val Gly Cys Thr Gly Asp His Glu Gly Val His Tyr Ser His Leu Glu | | | |
| 290 | 295 | 300 | |

Leu Ser Pro Gly Glu Pro Val Gln Glu Gly Asp Pro His Phe Arg Ser
305 310 315 320

Ala Leu Thr Ala His Pro Val Arg Asp Pro Val His Met Tyr Gln Leu
325 330 335

His Lys Ala Phe Ala Arg Ala Glu Leu Glu Arg Thr Tyr Gln Glu Ile
340 345 350

Gln Glu Leu Gln Trp Glu Ile Gln Asn Thr Ser His Leu Ala Val Asp
355 360 365

Gly Asp Arg Ala Ala Ala Trp Pro Val Gly Ile Pro Ala Pro Ser Arg
370 375 380

Pro Ala Ser Arg Phe Glu Val Leu Arg Trp Asp Tyr Phe Thr Glu Gln
385 390 395 400

His Ala Phe Ser Cys Ala Asp Gly Ser Pro Arg Cys Pro Leu Arg Gly
405 410 415

Ala Asp Arg Ala Asp Val Ala Asp Val Leu Gly Thr Ala Leu Glu Glu
420 425 430

Leu Asn Arg Arg Tyr His Pro Ala Leu Arg Leu Gln Lys Gln Gln Leu
435 440 445

Val Asn Gly Tyr Arg Arg Phe Asp Pro Ala Arg Gly Met Glu Tyr Thr
450 455 460

Leu Asp Leu Gln Leu Glu Ala Leu Thr Pro Gln Gly Gly Arg Arg Pro
465 470 475 480

Leu Thr Arg Arg Val Gln Leu Leu Arg Pro Leu Ser Arg Val Glu Ile
485 490 495

Leu Pro Val Pro Tyr Val Thr Glu Ala Ser Arg Leu Thr Val Leu Leu
500 505 510

Pro Leu Ala Ala Ala Glu Arg Asp Leu Ala Pro Gly Phe Leu Glu Ala
515 520 525

Phe Ala Thr Ala Ala Leu Glu Pro Gly Asp Ala Ala Ala Ala Leu Thr
530 535 540

Leu Leu Leu Leu Tyr Glu Pro Arg Gln Ala Gln Arg Val Ala His Ala
545 550 555 560

Asp Val Phe Ala Pro Val Lys Ala His Val Ala Glu Leu Glu Arg Arg
565 570 575

Phe Pro Gly Ala Arg Val Pro Trp Leu Ser Val Gln Thr Ala Ala Pro
580 585 590

Ser Pro Leu Arg Leu Met Asp Leu Leu Ser Lys Lys His Pro Leu Asp
595 600 605

Thr Leu Phe Leu Leu Ala Gly Pro Asp Thr Val Leu Thr Pro Asp Phe
610 615 620

Leu Asn Arg Cys Arg Met His Ala Ile Ser Gly Trp Gln Ala Phe Phe
625 630 635 640

Pro Met His Phe Gln Ala Phe His Pro Ala Val Ala Pro Pro Gln Gly
645 650 655

Pro Gly Pro Pro Glu Leu Gly Arg Asp Thr Gly Arg Phe Asp Arg Gln
660 665 670

Ala Ala Ser Glu Ala Cys Phe Tyr Asn Ser Asp Tyr Val Ala Ala Arg
675 680 685

Gly Arg Leu Ala Ala Ala Ser Glu Gln Glu Glu Glu Leu Leu Glu Ser
690 695 700

Leu Asp Val Tyr Glu Leu Phe Leu His Phe Ser Ser Leu His Val Leu
705 710 715 720

Arg Ala Val Glu Pro Ala Leu Leu Gln Arg Tyr Arg Ala Gln Thr Cys
725 730 735

Ser Ala Arg Leu Ser Glu Asp Leu Tyr His Arg Cys Leu Gln Ser Val

740

745

750

Leu Glu Gly Leu Gly Ser Arg Thr Gln Leu Ala Met Leu Leu Phe Glu
 755 760 765

Gln Glu Gln Gly Asn Ser Thr
 770 775

<210> 5
 <211> 1669
 <212> DNA
 <213> Homo sapiens

<220>
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 Met Phe Pro Ser Arg
 1 5
 agg aaa gcg gcg cag ctg ccc tgg gag gac ggc agg tcc ggg ttg ctc 103
 Arg Lys Ala Ala Gln Leu Pro Trp Glu Asp Gly Arg Ser Gly Leu Leu
 10 15 20
 tcc ggc ggc ctc cct cgg aag tgt tcc gtc ttc cac ctg ttc gtg gcc 151
 Ser Gly Gly Leu Pro Arg Lys Cys Ser Val Phe His Leu Phe Val Ala
 25 30 35
 tgc ctc tcg ctg ggc ttc ttc tcc cta ctc tgg ctg cag ctc agc tgc 199
 Cys Leu Ser Leu Gly Phe Phe Ser Leu Leu Trp Leu Gln Leu Ser Cys
 40 45 50
 tct ggg gac gtg gcc cgg gca gtc agg gga caa ggg cag gag acc tcg 247
 Ser Gly Asp Val Ala Arg Ala Val Arg Gly Gln Gly Gln Glu Thr Ser
 55 60 65

| | |
|---|-----|
| ggc cct ccc cgc gcc tgc ccc cca gag cgc ccc cct gag cac tgg gaa | 295 |
| Gly Pro Pro Arg Ala Cys Pro Pro Glu Pro Pro Pro Glu His Trp Glu | |
| 70 75 80 85 | |
| gaa gac gca tcc tgg ggc ccc cac cgc ctg gca gtg ctg gtg ccc ttc | 343 |
| Glu Asp Ala Ser Trp Gly Pro His Arg Leu Ala Val Leu Val Pro Phe | |
| 90 95 100 | |
| cgc gaa cgc ttc gag gag ctc ctg gtc ttc gtg ccc cac atg cgc cgc | 391 |
| Arg Glu Arg Phe Glu Glu Leu Leu Val Phe Val Pro His Met Arg Arg | |
| 105 110 115 | |
| ttc ctg agc agg aag aag atc cgg cac cac atc tac gtg ctc aac cag | 439 |
| Phe Leu Ser Arg Lys Lys Ile Arg His His Ile Tyr Val Leu Asn Gln | |
| 120 125 130 | |
| gtg gac cac ttc agg ttc aac cgg gca gcg ctc atc aac gtg ggc ttc | 487 |
| Val Asp His Phe Arg Phe Asn Arg Ala Ala Leu Ile Asn Val Gly Phe | |
| 135 140 145 | |
| ctg gag agc agc aac agc acg gac tac att gcc atg cac gac gtt gac | 535 |
| Leu Glu Ser Ser Asn Ser Thr Asp Tyr Ile Ala Met His Asp Val Asp | |
| 150 155 160 165 | |
| ctg ctc cct ctc aac gag gag ctg gac tat ggc ttt cct gag gct ggg | 583 |
| Leu Leu Pro Leu Asn Glu Glu Leu Asp Tyr Gly Phe Pro Glu Ala Gly | |
| 170 175 180 | |
| ccc ttc cac gtg gcc tcc ccg gag ctc cac cct ctc tac cac tac aag | 631 |
| Pro Phe His Val Ala Ser Pro Glu Leu His Pro Leu Tyr His Tyr Lys | |
| 185 190 195 | |
| acc tat gtc ggc ggc atc ctg ctg ctc tcc aag cag cac tac cgg ctg | 679 |
| Thr Tyr Val Gly Gly Ile Leu Leu Leu Ser Lys Gln His Tyr Arg Leu | |
| 200 205 210 | |
| tgc aat ggg atg tcc aac cgc ttc tgg ggc tgg ggc cgc gag gac gac | 727 |
| Cys Asn Gly Met Ser Asn Arg Phe Trp Gly Trp Gly Arg Glu Asp Asp | |
| 215 220 225 | |
| gag ttc tac cgg cgc att aag gga gct ggg ctc cag ctt ttc cgc ccc | 775 |
| Glu Phe Tyr Arg Arg Ile Lys Gly Ala Gly Leu Gln Leu Phe Arg Pro | |
| 230 235 240 245 | |
| tcg gga atc aca aci ggg tac aag aca ttt cgc cac ctg cac gac cca | 823 |
| Ser Gly Ile Thr Thr Gly Tyr Lys Thr Phe Arg His Leu His Asp Pro | |
| 250 255 260 | |
| gcc tgg cgg aag agg gac cag aag cgc atc gca gct caa aaa cag gag | 871 |

| | |
|--|------|
| Ala Trp Arg Lys Arg Asp Gln Lys Arg Ile Ala Ala Gln Lys Gln Glu | |
| 265 270 275 | |
| cag ttc aag gtg gac agg gag gga ggc ctg aac act gtg aag tac cat | 919 |
| Gln Phe Lys Val Asp Arg Glu Gly Gly Leu Asn Thr Val Lys Tyr His | |
| 280 285 290 | |
| gtg gct tcc cgc act gcc ctg tct gtg ggc ggg gcc ccc tgc act gtc | 967 |
| Val Ala Ser Arg Thr Ala Leu Ser Val Gly Gly Ala Pro Cys Thr Val | |
| 295 300 305 | |
| ctc aac atc atg ttg gac tgt gac aag acc gcc aca ccc tgg tgc aca | 1015 |
| Leu Asn Ile Met Leu Asp Cys Asp Lys Thr Ala Thr Pro Trp Cys Thr | |
| 310 315 320 325 | |
| ttc agc tga gctggatgga cagtgaggaa gcctgtacct acaggccata | 1064 |
| Phe Ser | |
| ttgtcaggc tcaggacaag gcctcaggtc gtgggcccag ctctgacagg atgtggagt | 1124 |
| gccaggacca agacagcaag ctacgcaatt gcagccaccc ggccgccaag gcaggcttgg | 1184 |
| gctgggcccag gacacgtggg gtgcttggga cgtgtcttgc catgcacagt gatcagagag | 1244 |
| aggctgggggt gtgtcctgtc cgggaccccc cctgccttcc tgcctaccct actctgacct | 1304 |
| cccttcacgtg cccaggcctg tgggtagtgg ggagggtcga acaggacaac ctctcatcac | 1364 |
| ccccactttt gtctcttctt gctgggctgc ctctgtcaga gacacagtgt aggggccatg | 1424 |
| cagctggcgt aggtggcagt igggccctgt gagggttagg acitcagaaa ccagagcaca | 1484 |
| agccccacag agggggaaca gccagcaccg ctctagcttg ttgttgccat gccggaatgt | 1544 |
| gggcctagtgt ttgccagatc ttctgatttt tcgaaagaaa ctagaatgct ggattcttaa | 1604 |
| gtgatatctt ctgatttttt aaatgatagc acctaaatga aactttcaaa aagtaaaaaa | 1664 |
| aaaaa | 1669 |

<210> 6
 <211> 327
 <212> PRT
 <213> Homo sapiens

<400> 6

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| Met Phe Pro Ser Arg Arg Lys Ala Ala Gln Leu Pro Trp Glu Asp Gly |
| 1 5 10 15 |

Arg Ser Gly Leu Leu Ser Gly Gly Leu Pro Arg Lys Cys Ser Val Phe

20

25

30

His Leu Phe Val Ala Cys Leu Ser Leu Gly Phe Phe Ser Leu Leu Trp
 35 40 45

Leu Gln Leu Ser Cys Ser Gly Asp Val Ala Arg Ala Val Arg Gly Gln
 50 55 60

Gly Gln Glu Thr Ser Gly Pro Pro Arg Ala Cys Pro Pro Glu Pro Pro
 65 70 75 80

Pro Glu His Trp Glu Glu Asp Ala Ser Trp Gly Pro His Arg Leu Ala
 85 90 95

Val Leu Val Pro Phe Arg Glu Arg Phe Glu Glu Leu Leu Val Phe Val
 100 105 110

Pro His Met Arg Arg Phe Leu Ser Arg Lys Lys Ile Arg His His Ile
 115 120 125

Tyr Val Leu Asn Gln Val Asp His Phe Arg Phe Asn Arg Ala Ala Leu
 130 135 140

Ile Asn Val Gly Phe Leu Glu Ser Ser Asn Ser Thr Asp Tyr Ile Ala
 145 150 155 160

Met His Asp Val Asp Leu Leu Pro Leu Asn Glu Glu Leu Asp Tyr Gly
 165 170 175

Phe Pro Glu Ala Gly Pro Phe His Val Ala Ser Pro Glu Leu His Pro
180 185 190

Leu Tyr His Tyr Lys Thr Tyr Val Gly Gly Ile Leu Leu Leu Ser Lys
195 200 205

Gln His Tyr Arg Leu Cys Asn Gly Met Ser Asn Arg Phe Trp Gly Trp
210 215 220

Gly Arg Glu Asp Asp Glu Phe Tyr Arg Arg Ile Lys Gly Ala Gly Leu
225 230 235 240

Gln Leu Phe Arg Pro Ser Gly Ile Thr Thr Gly Tyr Lys Thr Phe Arg
245 250 255

His Leu His Asp Pro Ala Trp Arg Lys Arg Asp Gln Lys Arg Ile Ala
260 265 270

Ala Gln Lys Gln Glu Gln Phe Lys Val Asp Arg Glu Gly Gly Leu Asn
275 280 285

Thr Val Lys Tyr His Val Ala Ser Arg Thr Ala Leu Ser Val Gly Gly
290 295 300

Ala Pro Cys Thr Val Leu Asn Ile Met Leu Asp Cys Asp Lys Thr Ala
305 310 315 320

Thr Pro Trp Cys Thr Phe Ser
325

<210> 7
<211> 26
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 5' primer for PCR (K3)

<400> 7
cccaagcttg ccgaggggga gcccga 26

<210> 8
<211> 29
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 3' primer for PCR (K3)

<400> 8
gctctagact gtcaggagag agttcgatt 29

<210> 9
<211> 25
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 5' primer for PCR (K3)

<400> 9
atggctgtgc gctctcgccg cccgt 25

<210> 10
<211> 25
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR (K3)

<400> 10
cgtcccgct gccgttgigg ctact

25

<210> 11
<211> 25
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR (K3)

<400> 11
agtagccaca acggcagcgg ggacg

25

<210> 12
<211> 24
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR (K3)

<400> 12
tcaggagaga gttcgattgt acct

24

<210> 13
<211> 28
<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR (K11)

<400> 13

ggaattccgg ccaggccgcc aaaaaggc

28

<210> 14

<211> 30

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR (K11)

<400> 14

cgggatccctc aggtgctgtt gccctgctcc

30

<210> 15

<211> 16

<212> PRT

<213> Artificial

<220>

<223> Description of Artificial Sequence: synthesised substance for assay

<400> 15

Val Leu Pro Gln Glu Glu Glu Gly Ser Gly Gly Gly Gln Leu Val Thr

1

5

10

15

<210> 16

<211> 20

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (K3 exon 1)

<400> 16

cgacagccca gcgagcgtcc

20

<210> 17

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (K3 exon 1)

<400> 17

ggagactggc aggctggaaa gc

22

<210> 18

<211> 20

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 1)

<400> 18

aggggggagcc cgaggaggag

20

<210> 19

<211> 20

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 1)

<400> 19

ctcctcctcg ggctccccct

20

<210> 20

<211> 27

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (K3 exon 2)

<400> 20

gagacatagt aattgttgcc tttcttt

27

<210> 21

<211> 25

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (K3 exon 2)

<400> 21

gtgaacattt tcatcacagc tccat

25

<210> 22

<211> 26

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (K3 exon 3)

<400> 22

tagatgcttt agtttatcgc tggttt

26

<210> 23

<211> 26

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (K3 exon 3)

<400> 23

ttaaaaaagg caaaatgtgt tgcctg

26

<210> 24

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

<400> 24

tctatactca gcagctgaga acca

24

<210> 25

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

<400> 25

tggtttctcag ctgctgagta taga 24

<210> 26

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

<400> 26

gaaatgggag ggcacaatga aaag 24

<210> 27

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

<400> 27

cttttcattg tgccctccca ttic 24

<210> 28

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

n 3)

<400> 28

tagccagiat gacccaaagg taac

24

<210> 29

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

<400> 29

gttaccttgg ggtcatactg gcta

24

<210> 30

<211> 31

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

<400> 30

aggccattca gaagccaaga agtaggagtg g

31

<210> 31

<211> 31

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K3 exon 3)

<400> 31
ccactccctac ttcttggctt ctgaatggcc t 31

<210> 32
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (K11 exon 1)

<400> 32
tcggagactc ctctggctgc t 21

<210> 33
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (K11 exon 1)

<400> 33
tagagcgggc gcagccgata a 21

<210> 34
<211> 25
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (K11 exon 2)

<400> 34
tttgataagc ttgtgccatc tcctc 25

<210> 35
<211> 25
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (K11 exon 2)

<400> 35
aggtatcagt gggatagctt atcat 25

<210> 36
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (K11 exon 3)

<400> 36
agctcatcac agatcccttc cctt 24

<210> 37
<211> 22
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (K11 exon 1)

<400> 37

actctgccac ccccagacct ag

22

<210> 38

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (K11 exon 4)

<400> 38

ttgctgatgg cctgtttctc tgat

24

<210> 39

<211> 21

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (K11 exon 4)

<400> 39

gtgtggccat gccacggccc a

21

<210> 40

<211> 23

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K11 exon 4)

<400> 40

tatgtcacig aggcctcacg tct

23

<210> 41
<211> 23
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K11 exon 4)

<400> 41
agacgtgagg cctcagtgac ata

23

<210> 42
<211> 24
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: primer for sequencing (K11 exon 4)

<400> 42
atgcatttcc aagccttcca ccca

24

<210> 43
<211> 24
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: Primer for sequencing (K11 exon 4)

<400> 43
tgggtggaag gcttggaaat gcat

24

<210> 44
<211> 20
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (beta4Gal-T7 exon 1)

<400> 44
tgcgagcgcc tgccccatgc 20

<210> 45
<211> 22
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (beta4Gal-T7 exon 1)

<400> 45
gatggcctcg ggttcccaga tt 22

<210> 46
<211> 21
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (beta4Gal-T7 exon 2)

<400> 46
tcctgaccct gtcccgcgct t 21

<210> 47

<211> 20
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (beta4Gal-T7 exon 2)

<400> 47
aggggtgccg aggggagagg

20

<210> 48
<211> 21
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (beta4Gal-T7 exon 3)

<400> 48
ctgcccagcc ttgcccaccc t

21

<210> 49
<211> 22
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (beta4Gal-T7 exon 3)

<400> 49
gctctgagca gagcaggctg tc

22

<210> 50
<211> 22

<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (beta4Gal-T7 exon 4)

<400> 50
agatgggccg agtgacgctg ct 22

<210> 51
<211> 21
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (beta4Gal-T7 exon 4)

<400> 51
ctcagggcag ccaccgcagc t 21

<210> 52
<211> 22
<212> DNA
<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (beta4Gal-T7 exon 5)

<400> 52
aagggcagcc tgaccccgac tt 22

<210> 53
<211> 23
<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (beta4Gal-T7 exon 5)

<400> 53

atgaccacct atccgtcccc aat

23

<210> 54

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for PCR and sequencing (beta4Gal-T7 exon 6)

<400> 54

cagccctgag tccgtgctct tt

22

<210> 55

<211> 23

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (beta4Gal-T7 exon 6)

<220>

<221> misc_feature

<223> Description of Artificial Sequence: 3' primer for PCR and sequencing (beta4Gal-T7 exon 6)

<400> 55

tgccctglag gtacaggctt cct

23

<210> 56

<211> 23

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for RT-PCR (K3)

<400> 56

cccagaaaaa gtccttcacg atg

23

<210> 57

<211> 30

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for RT-PCR (K3)

<400> 57

aactcttcta attgtcacc ttgatgtag

30

<210> 58

<211> 17

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Probe for RT-PCR (K3)

<400> 58

atgagtggtt catgcgc

17

<210> 59

<211> 20

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for RT-PCR (K11)

<400> 59

gctgaactgg aacgcacgta

20

<210> 60

<211> 19

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for RT-PCR (K11)

<400> 60

cgggatggig ctggaatac

19

<210> 61

<211> 20

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Probe for RT-PCR (K11)

<400> 61

agatccagga gttacagtgg

20

<210> 62

<211> 18

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 5' primer for RT-PCR (beta4Gal-T7)

<400> 62

cggcgcatla agggagct

18

<210> 63

<211> 21

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: 3' primer for RT-PCR (beta4Gal-T7)

<400> 63

tacccagttg tgattcccga g

21

<210> 64

<211> 14

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence: Probe for RT-PCR (beta4Gal-T7)

<400> 64

ctccagcttt tccg

14

<210> 65

<211> 2652

<212> DNA

<213> mouse

<220>

<221> CDS

<222> (1)..(2652)

<223>

<400> 65

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|---|-----|
| atg gcc gtg cgc tcc cgc cgc cca tgg gtg agc gtg gca ttg ggg ttg | 48 |
| Met Ala Val Arg Ser Arg Arg Pro Trp Val Ser Val Ala Leu Gly Leu | |
| 1 5 10 15 | |
| gtc ctg ggc ttc acc gcc gcg tcc tgg ctc atc gcc ccc cgg gtg gcc | 96 |
| Val Leu Gly Phe Thr Ala Ala Ser Trp Leu Ile Ala Pro Arg Val Ala | |
| 20 25 30 | |
| gag ctg agc gag aag agg cga cgc ggc tcc agt ctt tgc tcc tac tac | 144 |
| Glu Leu Ser Glu Lys Arg Arg Arg Gly Ser Ser Leu Cys Ser Tyr Tyr | |
| 35 40 45 | |
| ggc cgc tcg gct acc ggg ccc cgc gcg gac gcg cag cag ctg ctc ccc | 192 |
| Gly Arg Ser Ala Thr Gly Pro Arg Ala Asp Ala Gln Gln Leu Leu Pro | |
| 50 55 60 | |
| caa ccc cag tcc cgg ccg cgg cta gag cag tcg ccg ccc cct gcc agc | 240 |
| Gln Pro Gln Ser Arg Pro Arg Leu Glu Gln Ser Pro Pro Pro Ala Ser | |
| 65 70 75 80 | |
| cac gag ctc ccc ggt cct cag cag ccg gag gcg gcg ccc gga ggt ccc | 288 |
| His Glu Leu Pro Gly Pro Gln Gln Pro Glu Ala Ala Pro Gly Gly Pro | |
| 85 90 95 | |
| agt ttt cgg agc agc ccc tgg cag cag ccg gct ctg ttg ccg cag agg | 336 |
| Ser Phe Arg Ser Ser Pro Trp Gln Gln Pro Ala Leu Leu Pro Gln Arg | |
| 100 105 110 | |
| agg cga gga cac acg ccc gaa ggt gcg acg gcg ctt ccc ggc gct ccg | 384 |
| Arg Arg Gly His Thr Pro Glu Gly Ala Thr Ala Leu Pro Gly Ala Pro | |
| 115 120 125 | |
| gct gcc aaa ggg gaa cca gag gag gag gat ggg ggc gcg gct gac cct | 432 |
| Ala Ala Lys Gly Glu Pro Glu Glu Glu Asp Gly Gly Ala Ala Asp Pro | |
| 130 135 140 | |
| cgg aag ggt ggc cgg ccg ggg agc agc cac aac ggc agc ggg gac ggg | 480 |
| Arg Lys Gly Gly Arg Pro Gly Ser Ser His Asn Gly Ser Gly Asp Gly | |
| 145 150 155 160 | |
| ggi gcc gct gtc ccg acc tcc gga ccc ggg gac ttc ctg tac gtg ggt | 528 |
| Gly Ala Ala Val Pro Thr Ser Gly Pro Gly Asp Phe Leu Tyr Val Gly | |
| 165 170 175 | |

| | |
|---|------|
| gtg atg acc gca cag aag tac ctg ggc agt cgc gcg ctg gcc gcg cag | 576 |
| Val Met Thr Ala Gln Lys Tyr Leu Gly Ser Arg Ala Leu Ala Ala Gln | |
| 180 185 190 | |
| cgg acc tgg gcg cgc ttc atc cct ggc cgc gtg gag ttc ttt tcc agt | 624 |
| Arg Thr Trp Ala Arg Phe Ile Pro Gly Arg Val Glu Phe Phe Ser Ser | |
| 195 200 205 | |
| cag caa tct ccc agt gct gcg ctt ggc cag ccc ccg cca cct ttg cct | 672 |
| Gln Gln Ser Pro Ser Ala Ala Leu Gly Gln Pro Pro Pro Pro Leu Pro | |
| 210 215 220 | |
| gtc atc gcg ctg cca ggg gtc gac gat tcc tac cct ccc cag aaa aag | 720 |
| Val Ile Ala Leu Pro Gly Val Asp Asp Ser Tyr Pro Pro Gln Lys Lys | |
| 225 230 235 240 | |
| tcc ttc atg atg atc aag tac atg cac gac cac tat ctg gac aag tat | 768 |
| Ser Phe Met Met Ile Lys Tyr Met His Asp His Tyr Leu Asp Lys Tyr | |
| 245 250 255 | |
| gag tgg ttc atg cgc gcc gac gac gat gtc tac atc aaa ggt gat aag | 816 |
| Glu Trp Phe Met Arg Ala Asp Asp Asp Val Tyr Ile Lys Gly Asp Lys | |
| 260 265 270 | |
| tta gaa gaa ttt cta aga tcc cta aat agc agc aag cct ctc tac ctg | 864 |
| Leu Glu Glu Phe Leu Arg Ser Leu Asn Ser Ser Lys Pro Leu Tyr Leu | |
| 275 280 285 | |
| gga cag acg ggc ctg ggc aat act gaa gaa ctt gga aag ctg ggg ctg | 912 |
| Gly Gln Thr Gly Leu Gly Asn Thr Glu Glu Leu Gly Lys Leu Gly Leu | |
| 290 295 300 | |
| gag ccc ggg gag aac ttc tgc atg gga gga cct ggc atg atc ttc agc | 960 |
| Glu Pro Gly Glu Asn Phe Cys Met Gly Gly Pro Gly Met Ile Phe Ser | |
| 305 310 315 320 | |
| aga gag gtt ctc agg cgg atg gtg cct cat atc ggc gaa tgc ctc cga | 1008 |
| Arg Glu Val Leu Arg Arg Met Val Pro His Ile Gly Glu Cys Leu Arg | |
| 325 330 335 | |
| gag atg tac acc aca cac gaa gac gta gaa gta gga agg tgt gtt cgc | 1056 |
| Glu Met Tyr Thr Thr His Glu Asp Val Glu Val Gly Arg Cys Val Arg | |
| 340 345 350 | |
| cgt ttc ggc ggg acg cag tgt gtc tgg tct tat gag atg cag cag ctg | 1104 |
| Arg Phe Gly Gly Thr Gln Cys Val Trp Ser Tyr Glu Met Gln Gln Leu | |
| 355 360 365 | |
| ttc cat gaa aac tac gaa cac aat cgc aag ggt tac atc caa gac ctc | 1152 |

| | |
|---|------|
| Phe His Glu Asn Tyr Glu His Asn Arg Lys Gly Tyr Ile Gln Asp Leu | |
| 370 375 380 | |
| cac aac agc aaa atc cac gca gcc atc acg ctc cat ccg aac aaa agg | 1200 |
| His Asn Ser Lys Ile His Ala Ala Ile Thr Leu His Pro Asn Lys Arg | |
| 385 390 395 400 | |
| ccc gcg tac cag tac aga ctt cat aac tac atg ctc agc cgc aag atc | 1248 |
| Pro Ala Tyr Gln Tyr Arg Leu His Asn Tyr Met Leu Ser Arg Lys Ile | |
| 405 410 415 | |
| tcc gag ctc cgc tac cgc acc atc cag ctc cac cgg gag agc gct ctc | 1296 |
| Ser Glu Leu Arg Tyr Arg Thr Ile Gln Leu His Arg Glu Ser Ala Leu | |
| 420 425 430 | |
| atg agc aag ctc agc aac agt gaa gtg agc aaa gag gac caa cag ctg | 1344 |
| Met Ser Lys Leu Ser Asn Ser Glu Val Ser Lys Glu Asp Gln Gln Leu | |
| 435 440 445 | |
| gga agg acg ccg tcc ttc aac cac ttc cag cct cgg gag aga aat gaa | 1392 |
| Gly Arg Thr Pro Ser Phe Asn His Phe Gln Pro Arg Glu Arg Asn Glu | |
| 450 455 460 | |
| gtc atg gag tgg gag ttc ctg acg ggg aag ctg ctt tac tca gct gca | 1440 |
| Val Met Glu Trp Glu Phe Leu Thr Gly Lys Leu Leu Tyr Ser Ala Ala | |
| 465 470 475 480 | |
| gag aac cag cct cct cga cag agc atc aac agc atc cta agg tca gct | 1488 |
| Glu Asn Gln Pro Pro Arg Gln Ser Ile Asn Ser Ile Leu Arg Ser Ala | |
| 485 490 495 | |
| ctg gat gac act gtc ctg cag gtg atg gag atg atc aac gag aat gcc | 1536 |
| Leu Asp Asp Thr Val Leu Gln Val Met Glu Met Ile Asn Glu Asn Ala | |
| 500 505 510 | |
| aag agt agg ggc cga ctc atc gac ttc aag gaa att cag tat ggc tac | 1584 |
| Lys Ser Arg Gly Arg Leu Ile Asp Phe Lys Glu Ile Gln Tyr Gly Tyr | |
| 515 520 525 | |
| cgc agg gtt gat ccc atg cac ggg gtt gag tac ata ttg gac ctg cta | 1632 |
| Arg Arg Val Asp Pro Met His Gly Val Glu Tyr Ile Leu Asp Leu Leu | |
| 530 535 540 | |
| ctc ctg tac aaa agg cac aaa gga agg aaa ctg act gtg cct gtg agg | 1680 |
| Leu Leu Tyr Lys Arg His Lys Gly Arg Lys Leu Thr Val Pro Val Arg | |
| 545 550 555 560 | |
| cgc cat gcc tat ctt cag cag cca ttt agc aag cct ttc ttc aga gag | 1728 |
| Arg His Ala Tyr Leu Gln Gln Pro Phe Ser Lys Pro Phe Phe Arg Glu | |

| | | | |
|---|-----|-----|------|
| 565 | 570 | 575 | |
| gtg gaa gaa ctc gac gtc aac cgt ctg gtg gag agt atc aac agc ggt | | | 1776 |
| Val Glu Glu Leu Asp Val Asn Arg Leu Val Glu Ser Ile Asn Ser Gly | | | |
| 580 | 585 | 590 | |
| aca cag tca ttc tcc gtt ata tcc aat tct cta aaa att ctc tct tct | | | 1824 |
| Thr Gln Ser Phe Ser Val Ile Ser Asn Ser Leu Lys Ile Leu Ser Ser | | | |
| 595 | 600 | 605 | |
| ctt caa gag gcc aaa gac ata gga ggg cac aat gaa aag aaa gta cac | | | 1872 |
| Leu Gln Glu Ala Lys Asp Ile Gly Gly His Asn Glu Lys Lys Val His | | | |
| 610 | 615 | 620 | |
| att ctc gtt cca ctc gtt gga agg tac gac att ttc ttg aga ttc atg | | | 1920 |
| Ile Leu Val Pro Leu Val Gly Arg Tyr Asp Ile Phe Leu Arg Phe Met | | | |
| 625 | 630 | 635 | 640 |
| gaa aat ttt gaa agt acg tgt ctt atc cca aag caa aat gtc aag ctt | | | 1968 |
| Glu Asn Phe Glu Ser Thr Cys Leu Ile Pro Lys Gln Asn Val Lys Leu | | | |
| 645 | 650 | 655 | |
| gtc atc atc ctt ttc agc agg gat gct ggc caa gag tcc atc aag cac | | | 2016 |
| Val Ile Ile Leu Phe Ser Arg Asp Ala Gly Gln Glu Ser Ile Lys His | | | |
| 660 | 665 | 670 | |
| att gag ctg ata caa gaa tat cag agc agg tat ccc agt gca gaa atg | | | 2064 |
| Ile Glu Leu Ile Gln Glu Tyr Gln Ser Arg Tyr Pro Ser Ala Glu Met | | | |
| 675 | 680 | 685 | |
| atg ctc att ccc atg aag gga gag ttt tcc aga ggt ctt ggt ctt gaa | | | 2112 |
| Met Leu Ile Pro Met Lys Gly Glu Phe Ser Arg Gly Leu Gly Leu Glu | | | |
| 690 | 695 | 700 | |
| atg gct tct tcc cag ttt gac aat gac aca ttg ctg cta ttt tgt gat | | | 2160 |
| Met Ala Ser Ser Gln Phe Asp Asn Asp Thr Leu Leu Leu Phe Cys Asp | | | |
| 705 | 710 | 715 | 720 |
| gtt gac ttg att ttc aga gga gac ttc ctc caa cgc tgt cga gac aat | | | 2208 |
| Val Asp Leu Ile Phe Arg Gly Asp Phe Leu Gln Arg Cys Arg Asp Asn | | | |
| 725 | 730 | 735 | |
| aca gtt cag gga caa cag gta tat tac ccc atc atc ttt agc cag tat | | | 2256 |
| Thr Val Gln Gly Gln Gln Val Tyr Tyr Pro Ile Ile Phe Ser Gln Tyr | | | |
| 740 | 745 | 750 | |
| gac cca aag gtc acc cat atg aga aat cct ccc aca gag ggt gac ttt | | | 2304 |
| Asp Pro Lys Val Thr His Met Arg Asn Pro Pro Thr Glu Gly Asp Phe | | | |
| 755 | 760 | 765 | |

| | |
|---|------|
| gta ttc tca aag gaa act ggg ttt tgg aga gac tat ggc tac gga atc | 2352 |
| Val Phe Ser Lys Glu Thr Gly Phe Trp Arg Asp Tyr Gly Tyr Gly Ile | |
| 770 775 780 | |
| aca tgc att tac aaa agc gat cta ctg ggt gca ggt gga ttt gat acc | 2400 |
| Thr Cys Ile Tyr Lys Ser Asp Leu Leu Gly Ala Gly Gly Phe Asp Thr | |
| 785 790 795 800 | |
| tca ata caa ggc tgg gga ctg gaa gat gta gat ctc tat aat aaa gtc | 2448 |
| Ser Ile Gln Gly Trp Gly Leu Glu Asp Val Asp Leu Tyr Asn Lys Val | |
| 805 810 815 | |
| atc cta tct ggc tta cgg ccc ttc aga agt caa gaa gtg gga gtg gtg | 2496 |
| Ile Leu Ser Gly Leu Arg Pro Phe Arg Ser Gln Glu Val Gly Val Val | |
| 820 825 830 | |
| cat att ttc cat cct gtt cat tgt gat cct aac ttg gac cct aag cag | 2544 |
| His Ile Phe His Pro Val His Cys Asp Pro Asn Leu Asp Pro Lys Gln | |
| 835 840 845 | |
| tat aag atg tgc tta gga tcc aaa gca agt act ttt gcc tca acc atg | 2592 |
| Tyr Lys Met Cys Leu Gly Ser Lys Ala Ser Thr Phe Ala Ser Thr Met | |
| 850 855 860 | |
| caa ctg gct gaa ctc tgg tta gaa aaa cat ttg ggt gtc agg gat aat | 2640 |
| Gln Leu Ala Glu Leu Trp Leu Glu Lys His Leu Gly Val Arg Asp Asn | |
| 865 870 875 880 | |
| cga act ctc tcc | 2652 |
| Arg Thr Leu Ser | |

<210> 66
 <211> 884
 <212> PRT
 <213> mouse

<400> 66

| |
|---|
| Met Ala Val Arg Ser Arg Arg Pro Trp Val Ser Val Ala Leu Gly Leu |
| 1 5 10 15 |

| |
|---|
| Val Leu Gly Phe Thr Ala Ala Ser Trp Leu Ile Ala Pro Arg Val Ala |
| 20 25 30 |

Glu Leu Ser Glu Lys Arg Arg Arg Gly Ser Ser Leu Cys Ser Tyr Tyr
35 40 45

Gly Arg Ser Ala Thr Gly Pro Arg Ala Asp Ala Gln Gln Leu Leu Pro
50 55 60

Gln Pro Gln Ser Arg Pro Arg Leu Glu Gln Ser Pro Pro Pro Ala Ser
65 70 75 80

His Glu Leu Pro Gly Pro Gln Gln Pro Glu Ala Ala Pro Gly Gly Pro
85 90 95

Ser Phe Arg Ser Ser Pro Trp Gln Gln Pro Ala Leu Leu Pro Gln Arg
100 105 110

Arg Arg Gly His Thr Pro Glu Gly Ala Thr Ala Leu Pro Gly Ala Pro
115 120 125

Ala Ala Lys Gly Glu Pro Glu Glu Glu Asp Gly Gly Ala Ala Asp Pro
130 135 140

Arg Lys Gly Gly Arg Pro Gly Ser Ser His Asn Gly Ser Gly Asp Gly
145 150 155 160

Gly Ala Ala Val Pro Thr Ser Gly Pro Gly Asp Phe Leu Tyr Val Gly
165 170 175

Val Met Thr Ala Gln Lys Tyr Leu Gly Ser Arg Ala Leu Ala Ala Gln
180 185 190

Arg Thr Trp Ala Arg Phe Ile Pro Gly Arg Val Glu Phe Phe Ser Ser
195 200 205

Gln Gln Ser Pro Ser Ala Ala Leu Gly Gln Pro Pro Pro Pro Leu Pro
210 215 220

Val Ile Ala Leu Pro Gly Val Asp Asp Ser Tyr Pro Pro Gln Lys Lys
225 230 235 240

Ser Phe Met Met Ile Lys Tyr Met His Asp His Tyr Leu Asp Lys Tyr
245 250 255

Glu Trp Phe Met Arg Ala Asp Asp Asp Val Tyr Ile Lys Gly Asp Lys
260 265 270

Leu Glu Glu Phe Leu Arg Ser Leu Asn Ser Ser Lys Pro Leu Tyr Leu
275 280 285

Gly Gln Thr Gly Leu Gly Asn Thr Glu Glu Leu Gly Lys Leu Gly Leu
290 295 300

Glu Pro Gly Glu Asn Phe Cys Met Gly Gly Pro Gly Met Ile Phe Ser
305 310 315 320

Arg Glu Val Leu Arg Arg Met Val Pro His Ile Gly Glu Cys Leu Arg
325 330 335

Glu Met Tyr Thr Thr His Glu Asp Val Glu Val Gly Arg Cys Val Arg
340 345 350

Arg Phe Gly Gly Thr Gln Cys Val Trp Ser Tyr Glu Met Gln Gln Leu
355 360 365

Phe His Glu Asn Tyr Glu His Asn Arg Lys Gly Tyr Ile Gln Asp Leu
370 375 380

His Asn Ser Lys Ile His Ala Ala Ile Thr Leu His Pro Asn Lys Arg
385 390 395 400

Pro Ala Tyr Gln Tyr Arg Leu His Asn Tyr Met Leu Ser Arg Lys Ile
405 410 415

Ser Glu Leu Arg Tyr Arg Thr Ile Gln Leu His Arg Glu Ser Ala Leu
420 425 430

Met Ser Lys Leu Ser Asn Ser Glu Val Ser Lys Glu Asp Gln Gln Leu
435 440 445

Gly Arg Thr Pro Ser Phe Asn His Phe Gln Pro Arg Glu Arg Asn Glu
450 455 460

Val Met Glu Trp Glu Phe Leu Thr Gly Lys Leu Leu Tyr Ser Ala Ala

465

470

475

480

Glu Asn Gln Pro Pro Arg Gln Ser Ile Asn Ser Ile Leu Arg Ser Ala

485

490

495

Leu Asp Asp Thr Val Leu Gln Val Met Glu Met Ile Asn Glu Asn Ala

500

505

510

Lys Ser Arg Gly Arg Leu Ile Asp Phe Lys Glu Ile Gln Tyr Gly Tyr

515

520

525

Arg Arg Val Asp Pro Met His Gly Val Glu Tyr Ile Leu Asp Leu Leu

530

535

540

Leu Leu Tyr Lys Arg His Lys Gly Arg Lys Leu Thr Val Pro Val Arg

545

550

555

560

Arg His Ala Tyr Leu Gln Gln Pro Phe Ser Lys Pro Phe Phe Arg Glu

565

570

575

Val Glu Glu Leu Asp Val Asn Arg Leu Val Glu Ser Ile Asn Ser Gly

580

585

590

Thr Gln Ser Phe Ser Val Ile Ser Asn Ser Leu Lys Ile Leu Ser Ser

595

600

605

Leu Gln Glu Ala Lys Asp Ile Gly Gly His Asn Glu Lys Lys Val His

610

615

620

Ile Leu Val Pro Leu Val Gly Arg Tyr Asp Ile Phe Leu Arg Phe Met
625 630 635 640

Glu Asn Phe Glu Ser Thr Cys Leu Ile Pro Lys Gln Asn Val Lys Leu
 645 650 655

Val Ile Ile Leu Phe Ser Arg Asp Ala Gly Gln Glu Ser Ile Lys His
 660 665 670

Ile Glu Leu Ile Gln Glu Tyr Gln Ser Arg Tyr Pro Ser Ala Glu Met
 675 680 685

Met Leu Ile Pro Met Lys Gly Glu Phe Ser Arg Gly Leu Gly Leu Glu
 690 695 700

Met Ala Ser Ser Gln Phe Asp Asn Asp Thr Leu Leu Leu Phe Cys Asp
705 710 715 720

Val Asp Leu Ile Phe Arg Gly Asp Phe Leu Gln Arg Cys Arg Asp Asn
 725 730 735

Thr Val Gln Gly Gln Gln Val Tyr Tyr Pro Ile Ile Phe Ser Gln Tyr
 740 745 750

Asp Pro Lys Val Thr His Met Arg Asn Pro Pro Thr Glu Gly Asp Phe
 755 760 765

Val Phe Ser Lys Glu Thr Gly Phe Trp Arg Asp Tyr Gly Tyr Gly Ile
770 775 780

Thr Cys Ile Tyr Lys Ser Asp Leu Leu Gly Ala Gly Gly Phe Asp Thr
785 790 795 800

Ser Ile Gln Gly Trp Gly Leu Glu Asp Val Asp Leu Tyr Asn Lys Val
805 810 815

Ile Leu Ser Gly Leu Arg Pro Phe Arg Ser Gln Glu Val Gly Val Val
820 825 830

His Ile Phe His Pro Val His Cys Asp Pro Asn Leu Asp Pro Lys Gln
835 840 845

Tyr Lys Met Cys Leu Gly Ser Lys Ala Ser Thr Phe Ala Ser Thr Met
850 855 860

Gln Leu Ala Glu Leu Trp Leu Glu Lys His Leu Gly Val Arg Asp Asn
865 870 875 880

Arg Thr Leu Ser

<210> 67
<211> 2490
<212> DNA
<213> mouse

<220>

<221> CDS

<222> (1)..(2325)

<223>

<400> 67

| | |
|---|-----|
| atg cgg gcg tcg ctg ctg ctg tcc gtg ctg cgg ccc gcg ggg ccc gtg | 48 |
| Met Arg Ala Ser Leu Leu Leu Ser Val Leu Arg Pro Ala Gly Pro Val | |
| 1 5 10 15 | |
| gcc gtg ggc atc tct ctg ggc ttc acc ctg agc ctg ctg agc gtc acc | 96 |
| Ala Val Gly Ile Ser Leu Gly Phe Thr Leu Ser Leu Leu Ser Val Thr | |
| 20 25 30 | |
| tgg gtg gag gag cct tgc gga ccc ggg ccg ccc caa ccc gga gac tct | 144 |
| Trp Val Glu Glu Pro Cys Gly Pro Gly Pro Pro Gln Pro Gly Asp Ser | |
| 35 40 45 | |
| gag ctg ccg ccg cgc ggc aac acc aac gcg gcg cgc cgg ccc aac tcg | 192 |
| Glu Leu Pro Pro Arg Gly Asn Thr Asn Ala Ala Arg Arg Pro Asn Ser | |
| 50 55 60 | |
| gtg cag ccc gga tcc gag cgc gag agg ccc ggg gcc ggc gca ggc acc | 240 |
| Val Gln Pro Gly Ser Glu Arg Glu Arg Pro Gly Ala Gly Ala Gly Thr | |
| 65 70 75 80 | |
| ggg gag agc tgg gag cct cgt gtc ttg ccc tac cat ccc gcg cag cca | 288 |
| Gly Glu Ser Trp Glu Pro Arg Val Leu Pro Tyr His Pro Ala Gln Pro | |
| 85 90 95 | |
| ggc cag gcc acc aag aag gcc gtc aga act cgg tat atc agc acg gag | 336 |
| Gly Gln Ala Thr Lys Lys Ala Val Arg Thr Arg Tyr Ile Ser Thr Glu | |
| 100 105 110 | |
| ctg ggc atc agg cag aag ctt ctg gtg gca gtg ctg acc tca caa gcc | 384 |
| Leu Gly Ile Arg Gln Lys Leu Leu Val Ala Val Leu Thr Ser Gln Ala | |
| 115 120 125 | |
| acg ttg cct aca ctg ggt gtg gct gta aac cga act ctg gga cac cga | 432 |
| Thr Leu Pro Thr Leu Gly Val Ala Val Asn Arg Thr Leu Gly His Arg | |
| 130 135 140 | |
| ctg gag cat gta gtg ttc ctg acc ggt gcg agg ggc cgc cgg aca cct | 480 |
| Leu Glu His Val Val Phe Leu Thr Gly Ala Arg Gly Arg Arg Thr Pro | |
| 145 150 155 160 | |

| | |
|---|------|
| tca ggc atg gcg gtg gtg gca ctg ggc gaa gag agg ccc atc gga cac | 528 |
| Ser Gly Met Ala Val Val Ala Leu Gly Glu Glu Arg Pro Ile Gly His | |
| 165 170 175 | |
| ctg cac ctg gcg ctg cgc cac ctg ctg gag caa cac ggc gat gac ttt | 576 |
| Leu His Leu Ala Leu Arg His Leu Leu Glu Gln His Gly Asp Asp Phe | |
| 180 185 190 | |
| gac tgg ttt ttc cta gtg cct gat gcc acc tat act gaa gcg cat gga | 624 |
| Asp Trp Phe Phe Leu Val Pro Asp Ala Thr Tyr Thr Glu Ala His Gly | |
| 195 200 205 | |
| ctg gac cgc cta gct ggc cac ctc agc ctt gct tca gca acc cat ctc | 672 |
| Leu Asp Arg Leu Ala Gly His Leu Ser Leu Ala Ser Ala Thr His Leu | |
| 210 215 220 | |
| tat ctt ggc cgg ccg cag gac ttc atc ggt gga gat act acc cca ggc | 720 |
| Tyr Leu Gly Arg Pro Gln Asp Phe Ile Gly Gly Asp Thr Thr Pro Gly | |
| 225 230 235 240 | |
| cgc tac tgc cac ggg ggc ttt gga gtc ttg ctc tct cgc aca ctg cta | 768 |
| Arg Tyr Cys His Gly Gly Phe Gly Val Leu Leu Ser Arg Thr Leu Leu | |
| 245 250 255 | |
| cag caa ctg cgc ccc cac ctg gaa agc tgc cgc aac gac atc gtc agt | 816 |
| Gln Gln Leu Arg Pro His Leu Glu Ser Cys Arg Asn Asp Ile Val Ser | |
| 260 265 270 | |
| gct cgc ccg gat gag tgg ttg ggc cgc tgc atc ctt gat gcc aca ggc | 864 |
| Ala Arg Pro Asp Glu Trp Leu Gly Arg Cys Ile Leu Asp Ala Thr Gly | |
| 275 280 285 | |
| gtg ggc tgt act ggt gac cac gag gga atg cac tac aac tac ctg gaa | 912 |
| Val Gly Cys Thr Gly Asp His Glu Gly Met His Tyr Asn Tyr Leu Glu | |
| 290 295 300 | |
| ctg agc ccc ggg gag cct gta cag gag ggg gac cct cgt ttc cgc agc | 960 |
| Leu Ser Pro Gly Glu Pro Val Gln Glu Gly Asp Pro Arg Phe Arg Ser | |
| 305 310 315 320 | |
| gcc ttg aca gcc cat ccc gtg cgt gac cct gtg cac atg tac cag ctg | 1008 |
| Ala Leu Thr Ala His Pro Val Arg Asp Pro Val His Met Tyr Gln Leu | |
| 325 330 335 | |
| cac aaa gct ttt gcc cgc gct gag ctg gac cgc acg tac cag gag att | 1056 |
| His Lys Ala Phe Ala Arg Ala Glu Leu Asp Arg Thr Tyr Gln Glu Ile | |
| 340 345 350 | |
| caa gaa ttg cag tgg gag atc cag aat acc agc cga ctg gct gct gat | 1104 |

| | |
|---|------|
| Gln Glu Leu Gln Trp Glu Ile Gln Asn Thr Ser Arg Leu Ala Ala Asp | |
| 355 | 360 |
| 365 | |
| ggg gag aga gcc tct gcc tgg cca gtg ggc atc cca gca ccg tct cgc | 1152 |
| Gly Glu Arg Ala Ser Ala Trp Pro Val Gly Ile Pro Ala Pro Ser Arg | |
| 370 | 375 |
| 380 | |
| cct gcc tca cgc ttt gag gtt ctg cgc tgg gac tac ttc aca gaa caa | 1200 |
| Pro Ala Ser Arg Phe Glu Val Leu Arg Trp Asp Tyr Phe Thr Glu Gln | |
| 385 | 390 |
| 395 | 400 |
| tac gcg ttc tcc tgc gcc gat ggc tct ccc cgc tgc ccg ttg cgt ggg | 1248 |
| Tyr Ala Phe Ser Cys Ala Asp Gly Ser Pro Arg Cys Pro Leu Arg Gly | |
| 405 | 410 |
| 415 | |
| gcc gac cag gct gat gtg gct gac gtc ctg ggg aca gcc tta gag gag | 1296 |
| Ala Asp Gln Ala Asp Val Ala Asp Val Leu Gly Thr Ala Leu Glu Glu | |
| 420 | 425 |
| 430 | |
| ctc aac cgc cgt tac cag cca gcg ctg cag ctc cag aag caa cag ctg | 1344 |
| Leu Asn Arg Arg Tyr Gln Pro Ala Leu Gln Leu Gln Lys Gln Gln Leu | |
| 435 | 440 |
| 445 | |
| gtg aac ggc tac cgg cgt ttt gat cca gcc cga ggc atg gag tac aca | 1392 |
| Val Asn Gly Tyr Arg Arg Phe Asp Pro Ala Arg Gly Met Glu Tyr Thr | |
| 450 | 455 |
| 460 | |
| cta gac ctg cag ctg gaa gcg ctg aca ccc cag ggt ggc cgc tgg ccc | 1440 |
| Leu Asp Leu Gln Leu Glu Ala Leu Thr Pro Gln Gly Gly Arg Trp Pro | |
| 465 | 470 |
| 475 | 480 |
| ctc acc cgc agg gtg cag ctc ctt cgg ccc ttg agc cga gtg gag atc | 1488 |
| Leu Thr Arg Arg Val Gln Leu Leu Arg Pro Leu Ser Arg Val Glu Ile | |
| 485 | 490 |
| 495 | |
| ttg cct gta ccc tat gtc acc gag gct tct cgg ctc act gtg cta ctg | 1536 |
| Leu Pro Val Pro Tyr Val Thr Glu Ala Ser Arg Leu Thr Val Leu Leu | |
| 500 | 505 |
| 510 | |
| ccg ctg gct gca gcg gaa cga gac ctg gct tct ggc ttc tta gaa gcc | 1584 |
| Pro Leu Ala Ala Ala Glu Arg Asp Leu Ala Ser Gly Phe Leu Glu Ala | |
| 515 | 520 |
| 525 | |
| ttt gcc act gca gcc ctg gaa cct ggt gat gca gca gcc ttg acc ctg | 1632 |
| Phe Ala Thr Ala Ala Leu Glu Pro Gly Asp Ala Ala Ala Leu Thr Leu | |
| 530 | 535 |
| 540 | |
| ctg ctg ctg tat gag cca cgc cag gcc cag cgg gca gcc cac tca gac | 1680 |
| Leu Leu Leu Tyr Glu Pro Arg Gln Ala Gln Arg Ala Ala His Ser Asp | |

| | | | | |
|---|-----|-----|-----|------|
| 545 | 550 | 555 | 560 | |
| gtc ttc gca cct gtc aag gcc cac gtg gca gag cta gag cgg cgt ttc | | | | 1728 |
| Val Phe Ala Pro Val Lys Ala His Val Ala Glu Leu Glu Arg Arg Phe | | | | |
| | 565 | 570 | 575 | |
| cct ggt gcc cgg gtg ccc tgg ctg agt gtg cag aca gca gcg ccc tct | | | | 1776 |
| Pro Gly Ala Arg Val Pro Trp Leu Ser Val Gln Thr Ala Ala Pro Ser | | | | |
| | 580 | 585 | 590 | |
| cca ctg cgt ctg atg gat ctg ctg tcc aag aag cac cca cta gac act | | | | 1824 |
| Pro Leu Arg Leu Met Asp Leu Leu Ser Lys Lys His Pro Leu Asp Thr | | | | |
| | 595 | 600 | 605 | |
| ctg ttc ctg ctg gcc ggg cca gac acg gta ctg aca cct gat ttc ctg | | | | 1872 |
| Leu Phe Leu Leu Ala Gly Pro Asp Thr Val Leu Thr Pro Asp Phe Leu | | | | |
| | 610 | 615 | 620 | |
| aac cgc tgc cgc atg cat gcc atc tct ggc tgg cag gcc ttc ttc ccc | | | | 1920 |
| Asn Arg Cys Arg Met His Ala Ile Ser Gly Trp Gln Ala Phe Phe Pro | | | | |
| | 625 | 630 | 635 | 640 |
| atg cac ttc cag gcc ttc cac cct gct gtg gct cct cct cag ggc cct | | | | 1968 |
| Met His Phe Gln Ala Phe His Pro Ala Val Ala Pro Pro Gln Gly Pro | | | | |
| | 645 | 650 | 655 | |
| ggg cca cca gag ctg ggc cgt gac acc ggt cac ttt gat cgc cag gct | | | | 2016 |
| Gly Pro Pro Glu Leu Gly Arg Asp Thr Gly His Phe Asp Arg Gln Ala | | | | |
| | 660 | 665 | 670 | |
| gcc agt gag gca tgc ttc tac aac tcc gac tat gtg gcg gcc cgt ggc | | | | 2064 |
| Ala Ser Glu Ala Cys Phe Tyr Asn Ser Asp Tyr Val Ala Ala Arg Gly | | | | |
| | 675 | 680 | 685 | |
| cgg ctg gtg gcg gcc tcg gag cag gag gag gag ctg ctg gag agc ctg | | | | 2112 |
| Arg Leu Val Ala Ala Ser Glu Gln Glu Glu Glu Leu Leu Glu Ser Leu | | | | |
| | 690 | 695 | 700 | |
| gat gtg tac gag ttg ttt ctg cgc ttc tcc aac ttg cac gtg ctg aga | | | | 2160 |
| Asp Val Tyr Glu Leu Phe Leu Arg Phe Ser Asn Leu His Val Leu Arg | | | | |
| | 705 | 710 | 715 | 720 |
| gca gta gag cca gcc ttg ctg cag cgc tac cgg gcc cag ccg tgc agt | | | | 2208 |
| Ala Val Glu Pro Ala Leu Leu Gln Arg Tyr Arg Ala Gln Pro Cys Ser | | | | |
| | 725 | 730 | 735 | |
| gca cgg ctg agt gaa gac ctt tac cac cgc tgt cgc cag agc gta ctt | | | | 2256 |
| Ala Arg Leu Ser Glu Asp Leu Tyr His Arg Cys Arg Gln Ser Val Leu | | | | |
| | 740 | 745 | 750 | |

gag ggc ctt ggc tcc cgc acc cag ctt gcc atg ctg ctc ttt gag cag 2304
 Glu Gly Leu Gly Ser Arg Thr Gln Leu Ala Met Leu Leu Phe Glu Gln

755 760 765

gaa cag ggg aac agc acc taa gccccctgcac ctgtccctgc tcttccccag 2355
 Glu Gln Gly Asn Ser Thr

770

gaacctggag ccacgtgccca gcctcgtctgg acagggctgg ctgtagcctc agtcacctagg 2415

gcagcccact ggtcccttgt ctccttgcctt gtgggaccca tgggctcagg acaagccctg 2475

agacagatgc cctag 2490

<210> 68

<211> 774

<212> PRT

<213> mouse

<400> 68

Met Arg Ala Ser Leu Leu Leu Ser Val Leu Arg Pro Ala Gly Pro Val

1 5 10 15

Ala Val Gly Ile Ser Leu Gly Phe Thr Leu Ser Leu Leu Ser Val Thr

20 25 30

Trp Val Glu Glu Pro Cys Gly Pro Gly Pro Pro Gln Pro Gly Asp Ser

35 40 45

Glu Leu Pro Pro Arg Gly Asn Thr Asn Ala Ala Arg Arg Pro Asn Ser

50 55 60

Val Gln Pro Gly Ser Glu Arg Glu Arg Pro Gly Ala Gly Ala Gly Thr

65 70 75 80

Gly Glu Ser Trp Glu Pro Arg Val Leu Pro Tyr His Pro Ala Gln Pro
85 90 95

Gly Gln Ala Thr Lys Lys Ala Val Arg Thr Arg Tyr Ile Ser Thr Glu
100 105 110

Leu Gly Ile Arg Gln Lys Leu Leu Val Ala Val Leu Thr Ser Gln Ala
115 120 125

Thr Leu Pro Thr Leu Gly Val Ala Val Asn Arg Thr Leu Gly His Arg
130 135 140

Leu Glu His Val Val Phe Leu Thr Gly Ala Arg Gly Arg Arg Thr Pro
145 150 155 160

Ser Gly Met Ala Val Val Ala Leu Gly Glu Glu Arg Pro Ile Gly His
165 170 175

Leu His Leu Ala Leu Arg His Leu Leu Glu Gln His Gly Asp Asp Phe
180 185 190

Asp Trp Phe Phe Leu Val Pro Asp Ala Thr Tyr Thr Glu Ala His Gly
195 200 205

Leu Asp Arg Leu Ala Gly His Leu Ser Leu Ala Ser Ala Thr His Leu
210 215 220

Tyr Leu Gly Arg Pro Gln Asp Phe Ile Gly Gly Asp Thr Thr Pro Gly

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| 225 | | 230 | | 235 | | 240 |
| Arg Tyr Cys His Gly Gly Phe Gly Val Leu Leu Ser Arg Thr Leu Leu | | | | | | |
| | 245 | | 250 | | 255 | |
| Gln Gln Leu Arg Pro His Leu Glu Ser Cys Arg Asn Asp Ile Val Ser | | | | | | |
| | 260 | | 265 | | 270 | |
| Ala Arg Pro Asp Glu Trp Leu Gly Arg Cys Ile Leu Asp Ala Thr Gly | | | | | | |
| | 275 | | 280 | | 285 | |
| Val Gly Cys Thr Gly Asp His Glu Gly Met His Tyr Asn Tyr Leu Glu | | | | | | |
| | 290 | | 295 | | 300 | |
| Leu Ser Pro Gly Glu Pro Val Gln Glu Gly Asp Pro Arg Phe Arg Ser | | | | | | |
| 305 | | 310 | | 315 | | 320 |
| Ala Leu Thr Ala His Pro Val Arg Asp Pro Val His Met Tyr Gln Leu | | | | | | |
| | 325 | | 330 | | 335 | |
| His Lys Ala Phe Ala Arg Ala Glu Leu Asp Arg Thr Tyr Gln Glu Ile | | | | | | |
| | 340 | | 345 | | 350 | |
| Gln Glu Leu Gln Trp Glu Ile Gln Asn Thr Ser Arg Leu Ala Ala Asp | | | | | | |
| | 355 | | 360 | | 365 | |
| Gly Glu Arg Ala Ser Ala Trp Pro Val Gly Ile Pro Ala Pro Ser Arg | | | | | | |
| | 370 | | 375 | | 380 | |

Pro Ala Ser Arg Phe Glu Val Leu Arg Trp Asp Tyr Phe Thr Glu Gln
385 390 395 400

Tyr Ala Phe Ser Cys Ala Asp Gly Ser Pro Arg Cys Pro Leu Arg Gly
405 410 415

Ala Asp Gln Ala Asp Val Ala Asp Val Leu Gly Thr Ala Leu Glu Glu
420 425 430

Leu Asn Arg Arg Tyr Gln Pro Ala Leu Gln Leu Gln Lys Gln Gln Leu
435 440 445

Val Asn Gly Tyr Arg Arg Phe Asp Pro Ala Arg Gly Met Glu Tyr Thr
450 455 460

Leu Asp Leu Gln Leu Glu Ala Leu Thr Pro Gln Gly Gly Arg Trp Pro
465 470 475 480

Leu Thr Arg Arg Val Gln Leu Leu Arg Pro Leu Ser Arg Val Glu Ile
485 490 495

Leu Pro Val Pro Tyr Val Thr Glu Ala Ser Arg Leu Thr Val Leu Leu
500 505 510

Pro Leu Ala Ala Ala Glu Arg Asp Leu Ala Ser Gly Phe Leu Glu Ala
515 520 525

Phe Ala Thr Ala Ala Leu Glu Pro Gly Asp Ala Ala Ala Leu Thr Leu
530 535 540

Leu Leu Leu Tyr Glu Pro Arg Gln Ala Gln Arg Ala Ala His Ser Asp
545 550 555 560

Val Phe Ala Pro Val Lys Ala His Val Ala Glu Leu Glu Arg Arg Phe
565 570 575

Pro Gly Ala Arg Val Pro Trp Leu Ser Val Gln Thr Ala Ala Pro Ser
580 585 590

Pro Leu Arg Leu Met Asp Leu Leu Ser Lys Lys His Pro Leu Asp Thr
595 600 605

Leu Phe Leu Leu Ala Gly Pro Asp Thr Val Leu Thr Pro Asp Phe Leu
610 615 620

Asn Arg Cys Arg Met His Ala Ile Ser Gly Trp Gln Ala Phe Phe Pro
625 630 635 640

Met His Phe Gln Ala Phe His Pro Ala Val Ala Pro Pro Gln Gly Pro
645 650 655

Gly Pro Pro Glu Leu Gly Arg Asp Thr Gly His Phe Asp Arg Gln Ala
660 665 670

Ala Ser Glu Ala Cys Phe Tyr Asn Ser Asp Tyr Val Ala Ala Arg Gly
675 680 685

Arg Leu Val Ala Ala Ser Glu Gln Glu Glu Glu Leu Leu Glu Ser Leu
690 695 700

Asp Val Tyr Glu Leu Phe Leu Arg Phe Ser Asn Leu His Val Leu Arg
705 710 715 720

Ala Val Glu Pro Ala Leu Leu Gln Arg Tyr Arg Ala Gln Pro Cys Ser
725 730 735

Ala Arg Leu Ser Glu Asp Leu Tyr His Arg Cys Arg Gln Ser Val Leu
740 745 750

Glu Gly Leu Gly Ser Arg Thr Gln Leu Ala Met Leu Leu Phe Glu Gln
755 760 765

Glu Gln Gly Asn Ser Thr
770

<210> 69
<211> 984
<212> DNA
<213> mouse

<220>
<221> CDS
<222> (1).. (984)
<223>

<400> 69

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|---|-----|
| atg ttg ccc tcc cgg agg aaa gcg gcg cag ctg ccc tgg gag gat ggc | 48 |
| Met Leu Pro Ser Arg Arg Lys Ala Ala Gln Leu Pro Trp Glu Asp Gly | |
| 1 5 10 15 | |
| agg gcc agg ttg ctt cct gga ggc ctc cgc cgg aaa tgc tcc atc ttc | 96 |
| Arg Ala Arg Leu Leu Pro Gly Gly Leu Arg Arg Lys Cys Ser Ile Phe | |
| 20 25 30 | |
| cac ctc ttc att gcc ttt ctc ctg ttg gtc ttc ttc tcc ctg ctc tgg | 144 |
| His Leu Phe Ile Ala Phe Leu Leu Leu Val Phe Phe Ser Leu Leu Trp | |
| 35 40 45 | |
| ctg cag ctc agc tgt tct gga gat atg gcc cag gtg acc agg gga caa | 192 |
| Leu Gln Leu Ser Cys Ser Gly Asp Met Ala Gln Val Thr Arg Gly Gln | |
| 50 55 60 | |
| ggg caa gag acc tcg ggt cca ccc cgg gct tgc cct cca gag ccg ccc | 240 |
| Gly Gln Glu Thr Ser Gly Pro Pro Arg Ala Cys Pro Pro Glu Pro Pro | |
| 65 70 75 80 | |
| cct gag cac tgg gaa gaa gat gag tcc tgg ggg ccc cac cgc ttg gca | 288 |
| Pro Glu His Trp Glu Glu Asp Glu Ser Trp Gly Pro His Arg Leu Ala | |
| 85 90 95 | |
| gtg ctg gtg ccc ttt cgt gag cgc ttt gag gag ctg ctg gtc ttt gtg | 336 |
| Val Leu Val Pro Phe Arg Glu Arg Phe Glu Glu Leu Leu Val Phe Val | |
| 100 105 110 | |
| ccc cac atg cac cgc ttc cta agc agg aag agg atc cag cac cac atc | 384 |
| Pro His Met His Arg Phe Leu Ser Arg Lys Arg Ile Gln His His Ile | |
| 115 120 125 | |
| tat gtg ctc aac cag gig gac cat ttc agg ttc aat cgg gca gca ctc | 432 |
| Tyr Val Leu Asn Gln Val Asp His Phe Arg Phe Asn Arg Ala Ala Leu | |
| 130 135 140 | |
| atc aat gtg ggc ttc ctg gag agc agc aac agc aca gac tac atc gcc | 480 |
| Ile Asn Val Gly Phe Leu Glu Ser Ser Asn Ser Thr Asp Tyr Ile Ala | |
| 145 150 155 160 | |
| atg cac gat gtg gac ctg ctc cct ctc aat gag gag ctg gac tat ggc | 528 |
| Met His Asp Val Asp Leu Leu Pro Leu Asn Glu Glu Leu Asp Tyr Gly | |
| 165 170 175 | |
| ttc ccg gag gct ggg ccc ttc cat gtg gcc tcc cca gag ctc cac cct | 576 |
| Phe Pro Glu Ala Gly Pro Phe His Val Ala Ser Pro Glu Leu His Pro | |

| | | | |
|---|-----|-----|-----|
| 180 | 185 | 190 | |
| ctc tac cac tac aag acc tat gtg ggc ggc att ctg ctg ctg icc aaa | | | 624 |
| Leu Tyr His Tyr Lys Thr Tyr Val Gly Gly Ile Leu Leu Leu Ser Lys | | | |
| 195 | 200 | 205 | |
| cag cac tac cag ctg tgc aac gga atg tcc aac cgc ttt tgg ggc tgg | | | 672 |
| Gln His Tyr Gln Leu Cys Asn Gly Met Ser Asn Arg Phe Trp Gly Trp | | | |
| 210 | 215 | 220 | |
| ggc cga gag gat gat gaa ttc tac cgg cgc atc aaa gga gct ggc ctc | | | 720 |
| Gly Arg Glu Asp Asp Glu Phe Tyr Arg Arg Ile Lys Gly Ala Gly Leu | | | |
| 225 | 230 | 235 | 240 |
| cag ctt ttc cgc ccc tgc gga atc aca act ggg tac cag aca ttt cgc | | | 768 |
| Gln Leu Phe Arg Pro Ser Gly Ile Thr Thr Gly Tyr Gln Thr Phe Arg | | | |
| 245 | 250 | 255 | |
| cac ttg cat gac cct gcc tgg cgg aag agg gac caa aaa cgc att gcg | | | 816 |
| His Leu His Asp Pro Ala Trp Arg Lys Arg Asp Gln Lys Arg Ile Ala | | | |
| 260 | 265 | 270 | |
| gct caa aaa cag gaa cag ttc aag gtg gac cgg gag gga ggc ctg aac | | | 864 |
| Ala Gln Lys Gln Glu Gln Phe Lys Val Asp Arg Glu Gly Gly Leu Asn | | | |
| 275 | 280 | 285 | |
| act gtg aag tac cgg gtg gat tcc cgc acg gca ctg tct ata gga ggg | | | 912 |
| Thr Val Lys Tyr Arg Val Asp Ser Arg Thr Ala Leu Ser Ile Gly Gly | | | |
| 290 | 295 | 300 | |
| gcc ccg tgc act gtc ctc aat gtc atg ctg gac tgc gat aaa aca gcc | | | 960 |
| Ala Pro Cys Thr Val Leu Asn Val Met Leu Asp Cys Asp Lys Thr Ala | | | |
| 305 | 310 | 315 | 320 |
| acc cca tgg tgc ata ttt ggc tga | | | 984 |
| Thr Pro Trp Cys Ile Phe Gly | | | |
| 325 | | | |

<210> 70
 <211> 327
 <212> PRT
 <213> mouse

<400> 70

Met Leu Pro Ser Arg Arg Lys Ala Ala Gln Leu Pro Trp Glu Asp Gly

1 5 10 15

Arg Ala Arg Leu Leu Pro Gly Gly Leu Arg Arg Lys Cys Ser Ile Phe
20 25 30

His Leu Phe Ile Ala Phe Leu Leu Leu Val Phe Phe Ser Leu Leu Trp
35 40 45

Leu Gln Leu Ser Cys Ser Gly Asp Met Ala Gln Val Thr Arg Gly Gln
50 55 60

Gly Gln Glu Thr Ser Gly Pro Pro Arg Ala Cys Pro Pro Glu Pro Pro
65 70 75 80

Pro Glu His Trp Glu Glu Asp Glu Ser Trp Gly Pro His Arg Leu Ala
85 90 95

Val Leu Val Pro Phe Arg Glu Arg Phe Glu Glu Leu Leu Val Phe Val
100 105 110

Pro His Met His Arg Phe Leu Ser Arg Lys Arg Ile Gln His His Ile
115 120 125

Tyr Val Leu Asn Gln Val Asp His Phe Arg Phe Asn Arg Ala Ala Leu
130 135 140

Ile Asn Val Gly Phe Leu Glu Ser Ser Asn Ser Thr Asp Tyr Ile Ala
145 150 155 160

Met His Asp Val Asp Leu Leu Pro Leu Asn Glu Glu Leu Asp Tyr Gly
165 170 175

Phe Pro Glu Ala Gly Pro Phe His Val Ala Ser Pro Glu Leu His Pro
180 185 190

Leu Tyr His Tyr Lys Thr Tyr Val Gly Gly Ile Leu Leu Leu Ser Lys
195 200 205

Gln His Tyr Gln Leu Cys Asn Gly Met Ser Asn Arg Phe Trp Gly Trp
210 215 220

Gly Arg Glu Asp Asp Glu Phe Tyr Arg Arg Ile Lys Gly Ala Gly Leu
225 230 235 240

Gln Leu Phe Arg Pro Ser Gly Ile Thr Thr Gly Tyr Gln Thr Phe Arg
245 250 255

His Leu His Asp Pro Ala Trp Arg Lys Arg Asp Gln Lys Arg Ile Ala
260 265 270

Ala Gln Lys Gln Glu Gln Phe Lys Val Asp Arg Glu Gly Gly Leu Asn
275 280 285

Thr Val Lys Tyr Arg Val Asp Ser Arg Thr Ala Leu Ser Ile Gly Gly
290 295 300

Ala Pro Cys Thr Val Leu Asn Val Met Leu Asp Cys Asp Lys Thr Ala
305 310 315 320

Thr Pro Trp Cys Ile Phe Gly
325